

# Comparison of breast tenderness post-mastopexy: Ribeiro technique vs superomedial

Karla Elizabeth Jimenez Pavón<sup>1</sup>, Héctor Álvarez Trejo<sup>1</sup>, José Luis Villarreal Salgado<sup>1</sup>, Enrique Romero Algará<sup>1</sup>, Quitzia Libertad Torres Salazar<sup>2</sup>

<sup>1</sup>Institute of Security and Social Services for State Workers. Dr. Valentín Gómez Farías, Av. Soledad Orozco 203, El Capullo, 45100 Zapopan, Jalisco, México.

<sup>2</sup>Biomedical Research Institute Alpha 0.01. Paloma Street No.812 Colonia Fátima CP 34060 Durango, Mexico

## Corresponding Author\*

Quitzia Libertad Torres Salazar

Director "Alpha 0.01" Biomedical Research Institute.

Paloma 812, Colonia Fátima Durango, Dgo., C.P. 34060, Mexico.

E-mail: quitzia.torres@gmail.com

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## Abstract

Preserving the sensitivity of the nipple-areola complex, hereafter NAC, is one of the essential goals of breast surgery; however, providing standard values to evaluate and compare this indicator pre- and postoperatively remains a challenge for researchers and clinicians alike. To compare breast tenderness after mastopexy in patients operated with the Ribeiro vs. superomedial technique. Observational, prospective, longitudinal cohort study, conducted in 18-year-old patients with a diagnosis of gigantomastia or breast ptosis, who were scheduled for mastopexy at the Hospital Regional "Dr. Valentín Gómez Farías" of ISSSTE. The sample size was determined under a confidence level of 95%, a power of 80% and a maximum allowable difference of 15% to consider the equivalent techniques. After signing the informed consent form, each woman was evaluated to verify fulfillment of the selection criteria. To identify alterations in breast sensitivity, the thermotest and the Semmes-Weinstein monofilament were used at 4 times: T1 (preoperative), T2 (1st postoperative week), T3 (3rd postoperative month) and T4 (6th postoperative month). 83 patients successfully completed the study; 47 women in the Ribeiro mastopexy group and 37 women in the superomedial mastopexy group, with a median age of 37 and 45 years, respectively. A remarkable decrease in breast tenderness was observed with both techniques, without statistically significant differences between them.

**Keywords:** Breast Tenderness • Nipple-Areola Complex(NAC) • Mastopexy • Mammoplasty • Mastoplasty • Ribeiro • Superomedial

## Introduction

With more than 460,000 patients operated each year worldwide, mastopexy is one of the most demanded surgeries in our specialty [1]. Currently, the preservation of breast sensitivity after the intervention has become one of our main objectives at the time of performing the procedure, since it reflects one of the great concerns of the patients in the preoperative examination [2]. However, alterations in sensitivity are a frequent complication in breast surgery and are observed in from 15% to 70% of patients undergoing mastoplasty in the postoperative period [3]. Recent literature affirms that the post-surgical sensory outcome depends on the reduction technique used. Some authors have associated inferior pedicle techniques with better preservation of nipple and areola sensitivity, in contrast to superior pedicle ones, while others have found no differences between them [4,5].

The wide dissection during reduction and augmentation mastoplasties are those that eliminate the sensitivity of the breast skin and compromise the sensitivity of the NAC [6]. Therefore, it should be noted that since different techniques exist to perform breast reduction, the choice will depend mainly on the patient's anatomy and the expected results. A relevant aspect to highlight is that all techniques involving skin resection allow reducing the size of the areola, thus reducing the existing macrothelia, being the design of a pedicle or segment of breast tissue the one that will allow the adequate vascularization and innervation of the NAC. Considering the

above, we can notice that any breast surgery that interrupts these nerves will have the consequence of modifying or deteriorating the erogenous sensation of the nipple, being the fifth intercostal nerve the one that has the highest probability of significantly diminishing the sensation when it is injured. Nevertheless, it should be noted that the injury of one or two of these nerves does not completely condemn the erogenous sensation, but it is true that it deteriorates it [7,8].

Ultimately, it is important to emphasize how these surgeries are intended to achieve an optimal functional and aesthetic result, so the surgeon needs to be able to provide his patients with an accurate picture of what to expect regarding the sensitivity of the NAC and the breast skin after the procedure before surgery [9]. Nowadays, due to several surgical techniques, there is no consensus among the literature on which technique best preserves the sensitivity of the NAC after mastopexy or breast reduction surgery.

## Materials and Methods

An observational, analytical, longitudinal, prospective cohort study was designed in two groups of female patients who were diagnosed with gigantomastia and/or breast ptosis, programmed for mastopexy at Hospital Regional "Dr. Valentín Gómez Farías" of the Institute of Security and Social Services for State Workers (ISSSTE) Zapopan Jalisco", starting in November 2021. Patients who met the selection criteria were recruited until the sample size was completed and the surgical procedure was randomly assigned, taking into account the assignment given by the SPSS statistical program SPSS ver 25 Spanish. Women over 18 years of age with a diagnosis of gigantomastia or breast ptosis, with a signed informed consent letter, were included, excluding people with diabetes mellitus, as well as those patients with mental capacities that would prevent them from responding appropriately to an interrogation.

People who did not attend the follow-up appointments and those who withdrew their consent to participate in the study were eliminated. Likewise, the participation of individuals who suffered trauma in the evaluated area during the follow-up period were excluded from the study. Each of the patients were carefully informed about their participation in the study. Once the patients were admitted in compliance with the selection criteria, they were divided into two groups, with group A being assigned the Ribeiro mastopexy technique and group B the superomedial mastopexy technique (both techniques are routinely practiced at the surgeon's discretion at the host hospital).

Breast sensitivity and the nipple-areola complex were evaluated in all the participants at 4 times: T1 (preoperative), T2 (1st week postoperative), T3 (3rd month postoperative) and T4 (6th month postoperative). Two measuring instruments were used for this purpose, the Semmes-Weinstein monofilament and the thermotest. The sample was calculated using the formula for equivalence of proportions studies, estimating a conservation of sensitivity in 90% of the interventional cases. Considering a confidence level of 95% and a power of 80% with a one-tailed hypothesis. Quantitative variables were expressed as frequencies.

## Results

A total of 100 women were recruited, all of them fulfilled the inclusion criteria and the group was randomly assigned using the SPSS program SPSS ver 25 in Spanish. Subsequently, in the comprehensive evaluation to program the surgery, 13 participants were eliminated due to alterations in fasting glucose levels, and 4 participants were also eliminated for not showing up at their follow-up appointment (Figure 1).

The average age in the Ribeiro group was 37 years (31-46, q25-q75), and 45 in the superomedial group (40-48, q25-q75) (p=0.005). Seventy-six percent of the interventions in the Ribeiro group were mastopexy and only 11% were implant placement. In the superomedial group, 57% were mastopexy and 43% were implant placement (Table 1).

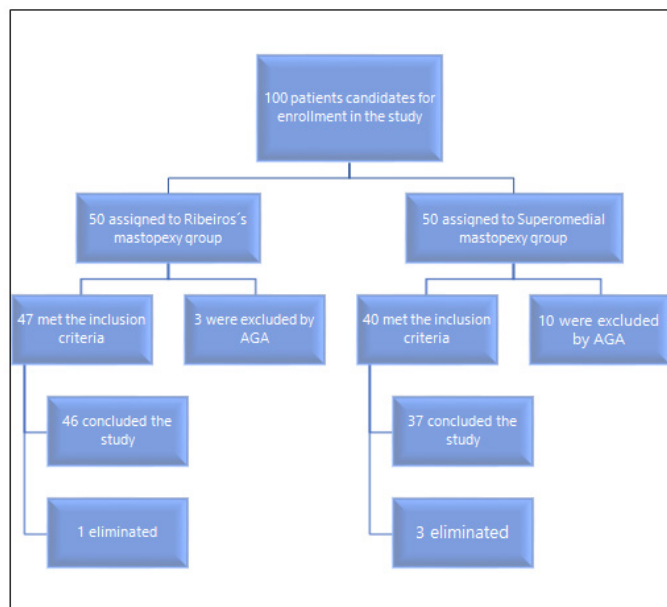


Figure 1. (Consort flow chart), Patient selection for mastopexy and sensitivity assessment.

Table 1. General characteristics of women intervened with mastopexy. Comparison between groups

N=83	RIBEIRO M. n= 47	SUPEROMEDIAL M. n=37	p
Age*	37 (31 – 46)	45 (40-48)	0.005
Surgery performed			
Mastopexy	76%	57%	0.062
Pexia + implant	11%	43%	
Bra Size			
S	-	2.70%	0.569
M	32.60%	37.80%	
L	45.70%	35.10%	
XL	21.70%	24.30%	

\* Data express the median (q25-q75), the difference was calculated with Mann Whitney U. The difference between percentages was calculated with the Chi-square test.

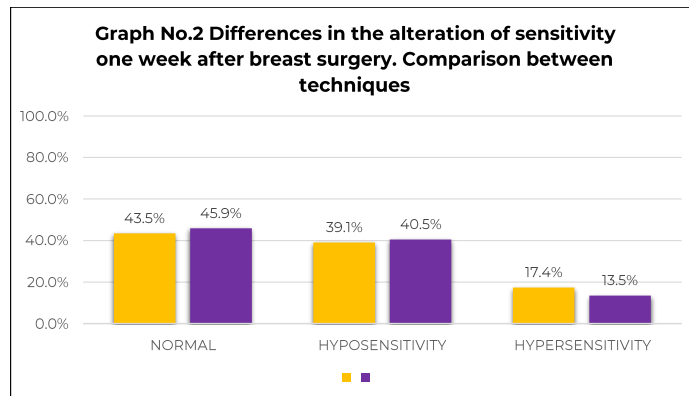


Figure 3. The difference between percentages was calculated with the chi-square test.

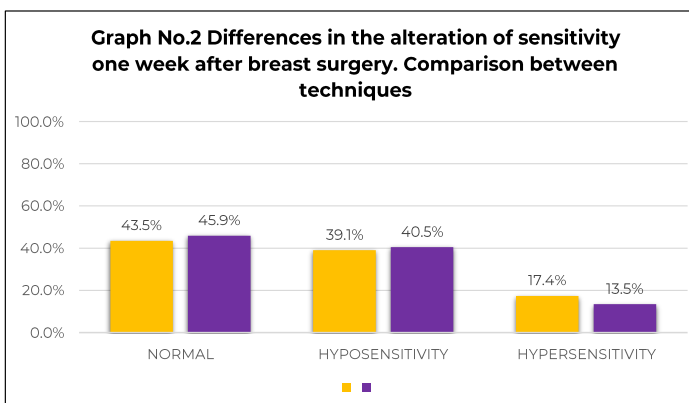


Figure 4. The difference between percentages was calculated with the chi-square test

Regarding the third month of evaluation, we observed that normal sensitivity was recovered in 43.5% and 45.9% of the women evaluated (Ribeiro and superomedial, respectively), decreasing the percentage of women with hypersensitivity. However, the percentage of hyposensitivity remained the same as the first week in the Ribeiro group, while in the superomedial group, it decreased by 5%. There were no statistically significant differences between groups (p=0.889) (Figure 4).

Discussion

Breast surgeries are cosmetic procedures that are becoming increasingly common, with an overall risk of complications of approximately 4% and a reoperation rate of 8 to 21% [10]. The sensitivity of the NAC and areolar pain have always raised major concerns for both patients and surgeons, sometimes preventing the former from undergoing cosmetic breast surgery. The temporary reduction in skin, areola and nipple sensitivity usually subsides eventually, with half of the patients reporting minimal numbness that usually disappears spontaneously or with massage over a period of 8 to 12 weeks; only a minority of patients reports numbness for longer periods of time. Occasionally, patients report increased sensitivity of the NAC, which can range from mild discomfort to moderate pain. Likewise, the erectile capacity of the areola may vary from paralysis to abnormally increased function, with frequent significant differences between ipsilateral and contralateral breasts [11]. The data obtained from our patients corroborate this information.

100% of the participants analyzed in both groups (Ribeiro and superomedial) were admitted with normal sensitivity. However, in the first week post-surgery, we observed that sensitivity decreased significantly and similarly in both study groups. Our results reveal that 39.1% and 45.9% of the 83 participants presented hyposensitivity, respectively. The data showed that even at the third revision (three months after the procedure), sensitivity had not been recovered in any of the groups, with the percentage of group B (Ribeiro's) remaining at 39.1%, while hyposensitivity in group A (superomedial) decreased from 45.9% to 40.5% at three months. These differences between techniques were not statistically significant.

In a study conducted by Kasielska-Trojan et al., the different factors

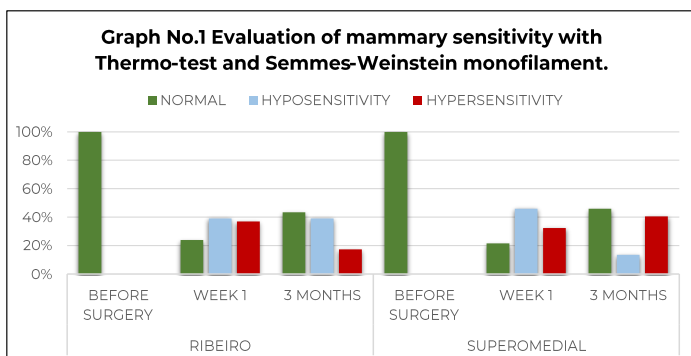


Figure 2. The difference between the changes (before and after) was determined with McNemar's test.

The results of the thermo-test, as well as the evaluation with Semmes-Weinstein monofilament, were reported normal before surgery. Subsequently, the evaluation of sensitivity with both methods was performed at postoperative 1st week and at 3rd month, with clear changes in breast sensitivity in both study groups (Figure 2). The differences reported in sensitivity were not significant between techniques in the first week of evaluation (p=0.822), thus, only 23.9% and 21.6%, respectively, retained breast sensitivity in the first week post-surgery (Figure 3).

that could influence the loss of sensitivity in the NAC after breast surgery were evaluated [12]. In that study, they determined that Weinstein-Semmes monofilaments are useful diagnostic tools when the following factors are considered in assessing NAC sensitivity: location (nipple versus areola), age, breast size, distance between the suprasternal notch and the nipple, history of childbirth and lactation. Hypertrophic breasts had significantly higher sensitivity thresholds for all NAC locations. Araco et al. reported on a retrospective cohort of 1200 patients followed up after breast surgery, in an attempt to evaluate the sensitivity of the NAC as well as the possible factors that conditioned this alteration in sensitivity [10]. The unique factor associated with alterations in NAC sensitivity and areolar pain at 6 months, was the type of skin incision used. The alterations were higher in the postoperative period with the periareolar incision than with the submammary incision ( $p= 0.001$ ). The periareolar incision almost tripled the risk of NAC sensitivity alterations and the risk of areolar pain. Ramón Zapata theorizes about the possible causes of the loss of breast sensitivity, associating it with the volume of breast tissue resected during surgery [6].

Giuseppe Giudice et al., retrospectively reviewed the records of 85 women who underwent a mammoplasty based on the central medial septum, to identify the advantages and disadvantages of the technique adopted [11]. In this study, contrary to what most authors report, sensitivity was preserved in all breasts. Nine patients showed delayed wound healing at the T-scar junction; in 5 patients, extending scars were observed. Derived from the results obtained by Giuseppe Giudice et al., compared to the various authors (including our results) where a loss of sensitivity is reported in approximately one third of the operated patients, mid-central septum-based mammoplasty seems to be an effective and safe option for breast reshaping, since none of their patients experienced nipple loss and all of them reported good nipple sensitivity.

## Conclusions

The importance of preserving sensibility after breast surgery is one of the issues to consider at the time of choosing the appropriate mastopexy technique, since it is not only about solving the aesthetic issue, but also about ensuring the best possible life quality for the patient after the surgery. Finally, the results obtained allow us to conclude that the loss of sensitivity after mastopexy is an expected condition in more than one third of the operated population, occurring from the first post-surgical week, regardless of the technique used, and although the advantages in the recovery of sensitivity with the Ribeiro technique over the superomedial technique, in the third month evaluated, these differences were not

statistically significant.

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