Sensitivity of the Nipple-Areola Complex and Sexual Function Following Reduction Mammaplasty

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Abstract

Background: The sensitivity of the nipple-areola complex (NAC) is very relevant to female sexuality.

Objective: To evaluate NAC sensitivity and sexual function after breast reduction, and to assess whether altered NAC sensitivity is related to sexual dysfunction.

Methods: The study included 80 patients, who were allocated to a control group with eutrophic breasts (CG, n = 20), a hypertrophy group without surgery (HG, n = 20), or a mammaplasty group (MG, n = 40). The MG was assessed preoperatively and 6 months postoperatively. The HG and CG were evaluated once. NAC sensitivity was assessed for touch, temperature, vibration, and pressure in four areola quadrants and the nipple. Sexual function was assessed with the Brazilian version of the Female Sexual Function Index, which has six domains (desire, arousal, lubrication, orgasm, satisfaction, and pain) and a total score that indicates the presence or absence of sexual dysfunction.

Results: Compared to the CG, the MG had worse sensitivity to temperature and pressure in the nipple and areola medial quadrants postoperatively (P < 0.01). Compared to their preoperative assessment, the MG had reduced temperature and pressure sensitivity in the nipple and areola medial quadrants postoperatively (P < 0.05). Compared to the CG and HG, patients in the MG had higher postoperative scores of excitation (P = 0.0001), lubrication (P = 0.0004), orgasm (P < 0.0001), and satisfaction (P < 0.0001). There was an association between sexual dysfunction and low NAC sensitivity to temperature and vibration (P ≤ 0.041) in the MG's preoperative and postoperative scores, and to touch, temperature, and pressure across all three groups.

Conclusions: Breast reduction with a superomedial pedicle reduced NAC sensitivity but did not interfere with sexual function.

Level of Evidence: 3

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The distribution pattern of the breast nerve branches has begun to attract increased attention, particularly regarding surgical techniques that preserve the nerve branches to facilitate the recovery of skin sensitivity after surgery.1 Different nerve branches contribute to the sensitivity of the nipple-areola complex (NAC). Among these branches, the most frequently cited are the medial and lateral branches of the fourth intercostal nerve. The lateral branch is present in all anatomic studies. The lateral nerve branch pierces the fascia of the serratus anterior muscle and runs toward the lateral margin of the pectoralis major muscle, turning at a right angle to penetrate the breast tissue to the NAC.2-4 Other branches of the intercostal nerve, such as the second, third, fifth, and sixth, as well as branches of the cervical plexus, form a microscopic subdermal plexus below the NAC and contribute to the ability of the NAC to perceive stimuli.2,5 Increasing evidence suggests that cutaneous sensitivity can impact the affective aspects of touch, including sexual function, which is recognized as an important dimension of personality that influences quality of life.6-8 Changes in sexuality have been reported in patients undergoing breast reduction, but very few studies have comprehensively evaluated the effects on sexual satisfaction and function.9-11 Moreover, although studies have assessed female sexual function after breast reduction, to our knowledge no study has quantitatively analyzed the relationship between postoperative changes in breast sensitivity and female sexual function.11-14 Therefore, we undertook a prospective controlled study to assess the sensitivity of the NAC and sexual function after breast reduction, to determine whether changes in NAC sensitivity were associated with sexual dysfunction.

METHODS

The study protocol for this single-center, prospective, controlled, and nonrandomized trial was approved by the Ethics Committee of the Universidade Federal de São Paulo. All protocols followed the ethical guidelines of the Declaration of Helsinki and all participants signed an informed consent form. The study was carried out between January 2012 and February 2014.

A total of 80 patients were selected from a plastic surgery outpatient unit at the Hospital das Clínicas Samuel Libanio, Universidade do Vale do Sapiucai, Brazil. Patients were allocated to three groups: the control group (CG, n = 20) consisted of women without breast hypertrophy; the breast hypertrophy group (HG, n = 20) consisted of women with breast hypertrophy who did not desire to undergo breast reduction; and the mammoplasty group (MG, n = 40) consisted of women with breast hypertrophy who underwent reduction mammoplasty. The women included in the study were between 18 and 50 years of age, had body mass indexes of 19 to 30 kg/m², were not postmenopausal, and were sexually active. Women were excluded if they had previous breast surgery, breast asymmetry, or any breast pathology; smoked or had stopped smoking less than one month before the study; had given birth or were breastfeeding less than one year before the study; had any neuropathy or uncontrolled comorbidity; or were undergoing psychiatric treatment. Breast hypertrophy patients and candidates for reduction mammoplasty were allocated to the MG according to the hospital’s schedule. Patients with breast hypertrophy who did not desire the operation were allocated to the HG.

A patient was considered to be a study loss if she did not attend the return visits, became pregnant during the study, or did not engage in sexual activity during the study period. Patients in the MG group underwent reduction mammoplasty with standard techniques using the superomedial pedicle for the rise of the NAC.15-18 All procedures were performed by the same surgical team. In the MG, skin sensitivity tests and the Female Sexual Function Index (FSFI) were administered at the time of hospital admission and 6 months postoperatively.9 Patients in the CG and HG did not undergo any surgical procedure, thus they were not admitted to hospital during the study. They were assessed once, after giving informed consent, immediately after their medical consultation at the outpatient plastic surgery unity of the university hospital.

Skin sensitivity tests were performed by the same examiner in a quiet environment. During the test, patients lay on a comfortable bed with their eyes blindfolded. The areola was divided into four quadrants, and the nipple was considered an additional point, for a total of five regions (Figure 1). In each region, four sensory modalities were tested: light touch, temperature (hot and cold), vibration, and pressure.19,20

![Figure 1. Points corresponding to the four areolar quadrants (P1–P4) and the nipple (P5), in right and left breasts. P1, areola superolateral point; P2, areola superomedial point; P3, areola inferomedial point; P4, areola inferolateral point; P5, nipple.](image-url)
Sensitivity to light touch was tested using a wad of cotton wool passed smoothly over the skin. Temperature sensitivity was tested with tubes containing water heated at 60°C and crushed ice, respectively, placed on the skin for two seconds. Vibration sensitivity was evaluated using a tuning fork vibrating at 128 vibrations per second placed in contact with the skin for two seconds (Figure 2). Pressure sensitivity was measured using Semmes-Weinstein filaments (SORRI, BAURU, SP, Brazil, INPI.7.102.105), corresponding to threshold/potential skin pressure values of 0.05, 0.2, 2, 4, 10, and 300 grams (Figure 2). The monofilament was used to exert pressure until it bent, and the pressure was maintained for 5 seconds. The perceived pressure value was recorded.

The NAC was rotated 90° (Figure 3) as a standard procedure during the operation. During postoperative sensory testing, the areolar points were adjusted as well to ensure that the same points in the NAC were compared pre- and postoperatively. Breasts were randomized to determine which side (left or right) of each patient was included in the statistical analysis. The random sequence was computer-generated (Bioestat 5.0, Instituto de Desenvolvimento Sustentável Mamirauá, Belém, PA, Brazil).

To evaluate sexual function, we used the validated Brazilian version of the FSFI, which comprises 19 questions on the sexual activity of patients during the last four weeks. Patient responses are grouped into six areas to obtain the scores: desire (items 1 and 2), excitation (items 3–6), lubrication (items 7–10), orgasm (items 11–13), satisfaction (items 14–16), and discomfort/pain (items 17–19). Earned points are multiplied by a correction factor for each independent domain, generating the corresponding scores. Final scores can range from 2 to 36, and higher scores indicate better sexual function. A total score less than or equal to 26.55 reflects sexual dysfunction.

Statistical Method

Due to the nature of the data, non-parametric tests were applied. The Kruskal-Wallis test was used to compare age and body mass index (BMI) among groups and the chi-squared test was used to assess the relationship between the resected weight and sexual function. Either Fisher’s exact test or the chi-squared test was used, as appropriate, for intragroup (MG: pre- and 6 months postoperatively) and intergroup (CG, HG, and MG: 6 months postoperatively) comparisons of categorical variables related to cutaneous sensitivity (light touch, vibration, and temperature). Tests were applied independently for each evaluated point. For numerical variables (pressure sensitivity and scores of FSFI), the Wilcoxon test was used for intragroup and the Kruskal-Wallis test for intergroup comparisons. The chi-squared test was used for intra- and intergroup comparisons regarding the presence of sexual dysfunction.

To determine whether there were associations between categorical variables related to changes in skin sensitivity (light touch, vibration, and temperature) and sexual dysfunction, Fisher’s exact test was used to compare within the MG group and the chi-squared test to compare among groups. Tests were applied independently for each evaluated point. Associations between changes in pressure sensitivity (values above the median) and sexual dysfunction were analyzed in the same manner. For all analyses, the level of rejection of the null hypothesis was set at 5% ($\alpha \leq 0.05$).

RESULTS

All 80 patients completed the study; there were no losses or exclusions. Women in the three groups were matched for age (CG: mean, 34.5 years; range, 21–50 years; HG: mean,
35.8 years; range, 20–50 years; and MG: mean, 30.5 years; range, 18–50 years) and BMI (Table 1). However, the proportion of patients with sexual dysfunction was lower in the MG: prior to the operation, 15 patients (37.5%) in the MG presented with sexual dysfunction, while 19 (95%) and 20 (100%) patients in the CG and HG did, respectively (P < 0.001).

In the MG, the weight of resected breast tissue resected ranged from 255 to 2720 g (median: 830 g; mean ± standard deviation: 914.7 ± 529.6 g). There were no relations between the resected weight and sexual dysfunction (P = 1.00). Tables 2-4 report the results of the sensitivity analyses and the intra- and intergroup comparisons.

Compared to the CG, the MG had worse sensitivity to temperature and pressure in the nipple and areola medial quadrants postoperatively (P < 0.01). Compared to preoperative analyses, the MG had reduced temperature and pressure sensitivity in the nipple and areola medial quadrants postoperatively (P < 0.05).

Table 5 shows the related domain scores of the FSFI results in the three groups and the intra- and intergroup comparisons. Compared to the CG and HG, patients in the MG had higher scores of excitation (P = 0.0001), lubrication (P = 0.0004), orgasm (P < 0.0001), and satisfaction (P < 0.0001) postoperatively.

Finally, Tables 6-8 summarize the associations between patients with sexual dysfunction and changes in skin sensitivity. There was an association between dysfunction and low NAC sensitivity to temperature and vibration (P ≤ 0.041) in the MG when comparing pre- and postoperative scores, and to touch, temperature, and pressure when comparing all three groups.

**DISCUSSION**

Preserving the sensitivity of the NAC and breast skin during mammoplasty is essential to helping patients achieve better postoperative outcomes. There is some controversy...
Table 3. Frequency of Patients with Abnormal Sensitivity to hot and Cold Temperature and Statistical Comparison Intra-group (Fisher Test) and Inter-groups (Chi-square Test)

<table>
<thead>
<tr>
<th>Groups</th>
<th>Hot Temperature n (%)</th>
<th>Cold Temperature n (%)</th>
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<tbody>
<tr>
<td>CG</td>
<td>2 (10)</td>
<td>––</td>
<td>––</td>
<td>1 (5)</td>
<td>––</td>
<td>––</td>
<td>––</td>
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<tr>
<td>HG</td>
<td>4 (20)</td>
<td>1 (5)</td>
<td>1 (5)</td>
<td>2 (5)</td>
<td>1</td>
<td>1 (5)</td>
<td>––</td>
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<td>1 (5)</td>
<td>––</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MG Pre</td>
<td>1 (3)</td>
<td>2 (5)</td>
<td>1 (3)</td>
<td>1 (3)</td>
<td>2 (5)</td>
<td>2 (5)</td>
<td>1 (3)</td>
<td>1 (3)</td>
<td>1 (3)</td>
<td>––</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MG PO 6 months</td>
<td>3 (8)</td>
<td>7 (18)</td>
<td>4 (10)</td>
<td>10 (25)</td>
<td>8 (20)</td>
<td>3 (8)</td>
<td>8 (20)</td>
<td>6 (15)</td>
<td>7 (18)</td>
<td>8 (20)</td>
<td></td>
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</tr>
</tbody>
</table>

MG Pre vs. MG PO 6 months (Fisher test)

- CG vs. HG vs. MG (PO 6 months) (Chi-square test)

P = 0.308
P = 0.078
P = 0.180
P = 0.004*
P = 0.044*
P = 0.500
P = 0.0144*
P = 0.542*
P = 0.0284*
P = 0.003*

CG, control group; HG, hypertrophy group; MG, mammaplasty group; P1, areola superolateral point; P2, areola superomedial point; P3, areola inferomedial point; P4, areola inferolateral point; P5, nipple; Pre, preoperative; PO, postoperative. *Statistically significant.

Table 4. Median Values of the Pressure for Each Assessed Point and Statistical Comparison Intra-group (Wilcoxon test) and Inter-groups (Kruskal-Wallis test)

<table>
<thead>
<tr>
<th>Groups</th>
<th>Hot Temperature g/mm²</th>
<th>Cold Temperature g/mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P1</td>
<td>P2</td>
</tr>
<tr>
<td>CG</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>HG</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>MG Pre</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>MG PO 6 months</td>
<td>4</td>
<td>27</td>
</tr>
</tbody>
</table>

MG Pre vs. MG PO 6 months (Wilcoxon)

- CG vs. HG vs. MG (PO 6 months) (Kruskal-Wallis)

P = 0.489
P < 0.000*
P = 0.326
P = 0.000*
P < 0.000*

P = 0.050
P = 0.000*
P = 0.053*
P < 0.000*
P = 0.011*

CG, control group; HG, hypertrophy group; MG, mammaplasty group; P1, areola superolateral point; P2, areola superomedial point; P3, areola inferomedial point; P4, areola inferolateral point; P5, nipple; Pre, preoperative; PO, postoperative. *Statistically significant.

Table 5. Median FSFI Scores and Statistical Comparisons Intra-group (Wilcoxon Test) and Inter-groups (Kruskal-Wallis Test)

<table>
<thead>
<tr>
<th>Domain</th>
<th>Control</th>
<th>Hypertrophy</th>
<th>Mammaplasty Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>PO 6 months</td>
<td>Pre</td>
</tr>
<tr>
<td>Desire</td>
<td>3.00</td>
<td>3.60</td>
<td>3.60</td>
</tr>
<tr>
<td>Excitation</td>
<td>2.00</td>
<td>2.25</td>
<td>4.05</td>
</tr>
<tr>
<td>Lubrification</td>
<td>3.45</td>
<td>3.60</td>
<td>4.80</td>
</tr>
<tr>
<td>Orgasm</td>
<td>2.80</td>
<td>2.80</td>
<td>4.80</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>1.80</td>
<td>3.60</td>
<td>4.80</td>
</tr>
<tr>
<td>Discomfort/Pain</td>
<td>5.00</td>
<td>5.60</td>
<td>5.40</td>
</tr>
<tr>
<td>Escore Total</td>
<td>19.95</td>
<td>22.20</td>
<td>27.90</td>
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</table>

CG, control group; HG, hypertrophy group; MG, mammaplasty group; PO, postoperative. *Statistically significant.
regarding innervation of the NAC based on anatomical studies, in terms of the identity of participating nerve branches and whether they are symmetrical between breasts.2,24-26

In the present study, the Semmes-Weinstein method was used to evaluate cutaneous pressure sensitivity.23,27-30 This method has been criticized as not offering a thorough assessment of pressure sensitivity because the range of tested values is large.31 Areas of bias with this method include variations between examiners and in the quality and maintenance of the product, as well as the need to convert the logarithmic results to measures of strength and pressure.1,30 To minimize bias, we took care of the equipment, replaced damaged monofilaments, and used proper application techniques. We converted measurements into grams using the manufacturer’s protocol. Finally, a single examiner performed all of the tests. This technique has the advantages of being reproducible, affordable, accessible, easy to learn, and of not requiring specific technology.23

Ducic et al, in a systematic review about nerve injuries and sensitivity alteration in augmentation mammoplasty, found a risk of any nerve injury in 13.6% of the patients. The intercostal cutaneous nerves to the breast were the most likely to be injured, followed by the T3-T5 intercostal cutaneous nerves to NAC.32

Only two previous studies have assessed the sensitivity to pressure before and after mammaplasty with a

<table>
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<tr>
<th>Table 6. Frequency of Patients with Abnormal Sensitivity to Superficial Touch and Vibration Variables That Presented Sexual Dysfunction and Statistical Comparisons Intra-group (Fisher Test) and Inter-groups (Chi-square Test)</th>
</tr>
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<tr>
<td><strong>Groups</strong></td>
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<tr>
<td></td>
</tr>
<tr>
<td>CG</td>
</tr>
<tr>
<td>HG</td>
</tr>
<tr>
<td>MG Pre</td>
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<tr>
<td>MG PO 6 months</td>
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<tr>
<td>MG Pre vs. MG PO 6 months (Fisher test)</td>
</tr>
<tr>
<td>MG PO 6 months vs HG (PO 6 months) (Chi-square test)</td>
</tr>
</tbody>
</table>

CG, control group; HG, hypertrophy group; MG, mammaplasty group; P1, areola superolateral point; P2, areola superomedial point; P3, areola inferomedial point; P4, areola inferolateral point; P5, nipple; Pre, preoperative; PO, postoperative. *Statistically significant.

<table>
<thead>
<tr>
<th>Table 7. Frequency of Patients with Abnormal Sensitivity to Temperature hot and Cold Variables That Presented Sexual Dysfunction and Statistical Comparisons Intra-group (Fisher Test) and Inter-groups (Chi-square Test)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groups</strong></td>
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<tr>
<td></td>
</tr>
<tr>
<td>CG</td>
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<tr>
<td>HG</td>
</tr>
<tr>
<td>MG Pre</td>
</tr>
<tr>
<td>MG PO 6 months</td>
</tr>
<tr>
<td>MG Pre vs. MG PO 6 months (Fisher test)</td>
</tr>
<tr>
<td>MG PO 6 months vs HG (PO 6 months) (Chi-square test)</td>
</tr>
</tbody>
</table>

CG, control group; HG, hypertrophy group; MG, mammaplasty group; P1, areola superolateral point; P2, areola superomedial point; P3, areola inferomedial point; P4, areola inferolateral point; P5, nipple; Pre, preoperative; PO, postoperative. *Statistically significant.
superomedial pedicle. Ferreira et al. observed decreased sensitivity at all points in the areola and nipple 6 months postoperatively. In contrast, we found that the sensitivity of the lateral quadrants did not differ pre- and postoperatively. Similarly, Chiari Junior et al. observed that in all subjects, sensation in the NAC returned to preoperative levels by 12 months postoperatively. Studies examining the outcomes of mammaplasty using the inferior pedicle technique reported improved areolar pressure sensitivity postoperatively. Wechselberger et al. reported no significant improvement in pressure sensitivity across the NAC compared to preoperative levels. Nevertheless, all of these studies were limited by small sample sizes.

In studies comparing the pressure sensitivity of the upper and lower pedicles, the inferior pedicle generally showed better NAC sensitivity postoperatively. Preserving the fourth lateral intercostal nerve would likely benefit postoperative sensitivity. Only Chiari Junior et al. clearly indicate that they had preserved this nerve. This possibility is supported by the observation that sensitivity close to preoperative levels was recovered when the lateral or superolateral pedicle technique was used to preserve the fourth lateral intercostal nerve.

In terms of temperature sensitivity, our findings corroborate those of other authors. Wechselberger et al. and Hamdi et al. observed reduced sensitivity to hot and cold temperatures in the NAC. Comparing the sensitivity between groups, the areola was significantly more sensitive to pressure in the CG than the HG, similar to results reported by Harbo, Jorum, and Roald and Delvecchyo, Caloca, and Gómez-Jauregui. For other sensory modalities there were no comparable studies in the literature.

Previous studies reveal a tendency toward reduced NAC sensitivity postoperatively in all sensory modalities when comparing upper with lower base pedicles. However, the published studies are limited by a small number of prospective studies, discrepancies between the results, methodological challenges, poor design, and challenges inherent to long-term follow-up (dropouts and postoperative morbidities). Therefore, more studies are required to clarify the relationship between breast surgery and skin sensitivity.

Sexuality surveys highlight growing evidence for the existence of mechanoreceptors that link the limbic system to affective touch in non-glabrous skin, creating pleasurable sensations. Depending on the anatomic location where the body is touched and the context (intensity and intent) of touching, the perception of the stimulus can be discriminative or interoceptive, generating psychological comfort or discomfort. However, objectively evaluating the cutaneous sensitivity of the breasts can be a challenging task.

Female sexual dysfunctions are characterized by alterations to the sexual response cycle, which is the process of desire, arousal, orgasm, and resolution. Dysfunction can be the lack of a stage, excessive response, or discomfort and/or pain during the sexual response cycle. Various triggers can cause occasional or prolonged sexual dysfunction, including problems with internal stimuli (thoughts and fantasies) and inadequate stimulation of erogenous zones. This complexity makes the study of mammary cutaneous sensitivity extremely relevant.

To capture the patient perspective of their health status, numerous instruments to assess patient quality of life have been produced and validated. The FSFI is the first instrument for assessing female sexual function that has been validated in a Brazilian context and meets all of the requirements of the proposed international validation protocol.

<table>
<thead>
<tr>
<th>Groups</th>
<th>P1 (%)</th>
<th>P2 (%)</th>
<th>P3 (%)</th>
<th>P4 (%)</th>
<th>P5 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG</td>
<td>4 (21)</td>
<td>8 (42)</td>
<td>6 (31)</td>
<td>6 (31)</td>
<td>9 (47)</td>
</tr>
<tr>
<td>HG</td>
<td>2 (10)</td>
<td>1 (5)</td>
<td>–</td>
<td>11 (55)</td>
<td>8 (40)</td>
</tr>
<tr>
<td>MG Pre</td>
<td>6 (40)</td>
<td>4 (26)</td>
<td>7 (46)</td>
<td>7 (46)</td>
<td>4 (26)</td>
</tr>
<tr>
<td>MG PO 6 months</td>
<td>11 (57)</td>
<td>6 (31)</td>
<td>5 (26)</td>
<td>7 (36)</td>
<td>4 (21)</td>
</tr>
<tr>
<td>MG Pre vs. PO 6 months (Fisher test)</td>
<td>P = 0.489</td>
<td>P = 0.946</td>
<td>P = 0.383</td>
<td>P = 0.820</td>
<td>P = 0.980</td>
</tr>
<tr>
<td>CG vs. HG vs. MG (PO 6 months) (Chi-square test)</td>
<td>P = 0.002*</td>
<td>P = 0.023*</td>
<td>P = 0.025*</td>
<td>P = 0.043*</td>
<td>P = 0.218</td>
</tr>
</tbody>
</table>

P1, areola superolateral point; P2, areola superomedial point; P3, areola inferomedial point; P4, areola inferolateral point; P5, nipple; PO, postoperative; CG, control group; HG, hypertrophy group; MG, mammaplasty group. *Statistically significant.

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The MG group did not have a significant difference in sexual function pre- and postoperatively. This finding is in contrast to that of Beraldo et al., who observed differences in the total sexual function score and in the domains of desire, arousal, and lubrication. Our results also differ from those found by Resende et al., who used a different tool to measure sexual function and reported improvement in sexual function overall, and specifically in the domains of desire/interest, foreplay, arousal/tune, and orgasm/satisfaction.

Romeo et al., reported significantly lower excitation in patients undergoing breast reduction compared to the control group. However, Cerovac et al., documented a significant association between patients’ subjective impressions and FSFI scores, demonstrating an improvement in the MG compared to the CG.

Consistent with Cerovac et al., we also observed an improvement in the total sexual function score and in the arousal, lubrication, orgasm, and satisfaction domains at six months postoperatively in the MG compared to the CG. These same authors reported that patients with good sexual function were more satisfied with the aesthetic/functional outcome of surgery, which could explain why the MG had better sexual function than the other groups.

Given that the CG and HG in our study had worse sexual function scores, including the total score, compared to the MG six months postoperatively, the results demonstrate that female sexual function is multifactorial and determined by more than breast sensitivity alone. Therefore, we must consider other parameters that influence sexual function, such as cultural, social, educational, and interpersonal issues. The improvement in some domains of sexual function index observed in the MG postoperatively could also potentially be due to other breast reduction effects, completely unrelated to nipple sensation, such as less back pain or better self-esteem, which have already been demonstrated in previous studies. However, we were not able to find studies in the published literature correlating these aspects and women’s sexual function.

Our study has some weak points. Two of these are that we did not record the women’s hormonal cycles and pain sensitivities, which could influence not only NAC sensitivity, but also sexual function. Another weakness is our follow-up period of 6 months. Our findings undoubtedly would be stronger if we had a longer follow-up. However, many times is very difficult to follow up with patients from a public health service for a longer time.

When it comes to interpersonal relationships, it is extremely difficult to standardize the study sample because relationships are so labile. We considered the absence of sexual activity, and not relationship instability, as an exclusion criterion. According to Jaspars et al., the sensitivity of the mammary skin, especially the NAC, is highly significant in sexuality.

In the evaluation of cutaneous sensitivity and sexual dysfunction, the MG was significantly worse 6 months postoperatively at sensing vibration (P = 0.041), heat (P = 0.020), and cold (P = 0.041). These relationships could suggest an association between sensory deficit and worse sexual function. However, there were no differences on the FSFI total score pre- and postoperatively, indicating that the operation, despite leading to a decrease in NAC sensitivity, did not influence patients’ sexual function. On the other hand, the arousal and lubrication domains may be related to reduced skin sensitivity, which suggests that this aspect could contribute to the lack of postoperative improvement in sexual function in dysfunctional patients. Overall, our findings contribute to the study of postoperative cutaneous sensitivity and its psychological effects in the context of sexuality, a topic that has not been extensively studied in a quantitative manner. However, our study has several limitations: the non-randomized design, the unique assessment of patients in the CG and HG, and the small sample size, besides the fact that the influence of hormonal cycles on women's sexual function was not considered.

CONCLUSION

In the present study, reduction mammaplasty with superomedial pedicle led to a postoperatively cutaneous NAC sensitivity decrease, without impact on patients’ sexual function. However, further randomized controlled studies with larger samples and addressing a larger number of variables are necessary to clarify the complex role of reduction mammaplasty on women’s sexual function.

Disclosures

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