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Surgical therapy of breast hypertrophy: a comparison of complications and satisfaction rate in large and small superior pedicle custom-made reduction mammaplasty

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Abstract. – OBJECTIVE: The reduction mammaplasty is indicated for patients with symptomatic breast hypertrophy. Although surgery is considered the gold standard treatment, it is still debated which is the complication rate and whether or not there is an increased complication rate with increased tissue resection per breast. The main objective of this retrospective study was to determine whether the rates of complications are higher in large reductions (≥2000 g per breast) as compared with smaller reductions (≤1999 g per breast) using the superior pedicle custom-made technique.

PATIENTS AND METHODS: A retrospective study of 90 consecutive operated patients was performed. All the patients underwent a bilateral breast reduction for macromastia. 43 patients had a reduction of 1999 g or less and 47 patients had a reduction of 2000 g or more.

RESULTS: There were no statistically significant differences in the rates of nipple necrosis, hematoma, seroma, wound dehiscence, wound infection, loss or reduction of nipple sensation, and a pathologic scar between the large and small resections.

CONCLUSIONS: The large reduction patients pointed higher mean satisfaction rate than the small reduction patients. The superior pedicle custom-made technique is a safe method of breast reduction regardless of the degree of parenchymal resection, achieving a successful aesthetic outcome with minimal scarring and high satisfaction rate for both small and large breast reduction.

Key Words

Breast reduction, Gigantomastia, Germal flap, Custom-made technique.

Introduction

Reduction mammaplasty is one of the most common procedures performed by plastic surgeons[1]. The reduction is indicated for patients with symptomatic breast hypertrophy. Large ptotic breasts can become troublesome for patients, leading to mastalgia, ulceration of the skin on the mammary crease, postural problems, and related back pain, strongly affecting social life of the patients[2]. These patients can benefit greatly from a reduction in breast size, as most symptoms are relieved by reduction mammaplasty. Goals of reduction mammaplasty are to improve physical, emotional and psychosocial discomforts, to restore a conical-shaped breast stable over time, maintaining scars as short as possible[3,4].

When performing breast reduction surgery, it is very important to preserve the blood supply of tissues as well as sensitivity, especially of the nipple-areolar complex (NAC)[2,5]. In 1922, Thorek described standard free nipple grafting reduction mammaplasty in gigantomastia[6]. Although this technique remains simple and reliable, it can produce a non-aesthetic breast and nipple with poor projection and no sensitivity. It has gradually been superseded by dermoglandular flap techniques and several pedicle techniques have been described in breast reduction surgery[2,7].

However, like all surgical procedures, these new techniques are not complications free. Reported complication rates vary widely, and there is controversy as to whether or not there is an increased complication rate with increased tissue resection per breast[8,9]. The main objective of this retrospective study was to determine whether the rates of complications are higher in large reductions (≥ 2000 g per breast) as compared with smaller reductions (≤ 1999 g per breast) using the superior pedicle custom-made technique. We used the crossover point between small and large reductions at 2000 g of tissue per breast, following a simple cut-off method, as already described by Chang et al[8] and O'Grady et al[9].

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Patients and Methods

Patients

A retrospective chart review of 90 consecutive patients performed between September 2010 and June 2015 was considered. All the patients underwent bilateral breast reductions for macromastia at our facilities. Smokers, patients with diabetes mellitus or those who had previously undergone breast surgery or a balancing procedure for cancer were excluded because of the possible bias in the results analysis.

All the procedures were performed by the same surgical team. The entire protocol was approved by the Ethics Committee of Sapienza, University of Rome. Age, height, weight (in kg), body mass index (in kg per square meter) (BMI), resection weight per breast (in g) and midclavicular point-nipple distance were recorded (Figure 1).

Surgical Technique

Keeping in mind the anatomical variability of each patient, we performed a custom-made reduction for each patient as previously described elsewhere[10,11]. Preoperative markings were made with the patient in standing position, considering standard marking lines from the middle-clavicular point to the nipple. The new nipple was positioned at 19-22 cm from the midclavicular point, and the new areola was marked at this point with a 3.5-4 cm radius. Therefore, with the patient lying down, we considered 10-11 cm of distance from the media-sternal to the projection of the new nipple on the mammary crease. After marking of the future vertical scar, the level of the new inframammary line (IML) was moved 6 cm below the new areola. The excess periareolar skin was preoperatively evaluated with a pinch test to allow appropriate skin resection, resulting in a rhomboidal draw. After local anesthesia with adrenalin 1:200.000 infiltration and a careful depithelization of the periareolar area, dermal incisions were made up to the pectoralis muscle fascia through glandular-adipose tissue. Saving the dermal flap previously depithelized, glandular resection was performed according to the traditional inverted V shape and a pyramidal glandular portion was removed inferiorly up to the mammary crease and superiorly approximately 1 cm below the dermal flap. Medial and lateral edges of the inverted V were rejoined and the dermal flap was then fixed with 3 interrupted 2/0 resorbable stitches to the new mammary crease, to hold the inferior pole of the new breast, preventing a recurrence of ptosis such as very often happens with vertical scar techniques. Skin resection was made after glandular resection to minimize the tension of the sutures. A round block was performed around the areola, followed by closure of the vertical scar, which was converted to an L-shape scar only when the skin excess was too redundant in the lower pole, to keep the vertical scar no longer than 6 cm for a better aesthetic outcome[10]. Closed suction drains were used routinely and were usually removed on the third postoperative day.

Evaluation of complications and rate satisfaction

Data regarding complications rate were recorded for each patient of both groups. Occurring complications were nipple necrosis, hematoma, seroma, wound dehiscence, wound infection, loss or reduction of nipple sensation, and pathologic scar. Wound infection was diagnosed by a positive culture swab. Loss or reduction of nipple was scored by a subjective patient base. Patients were

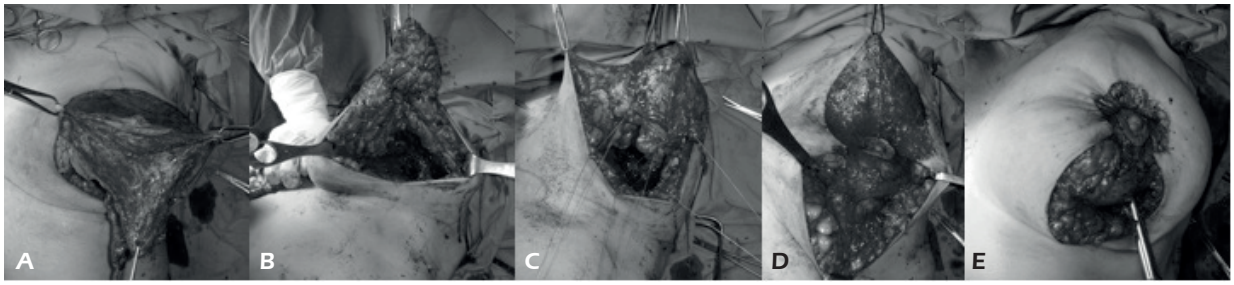

Figure 1. Intra- operative images of surgical procedure: **A**, depithelization of superior pedicled dermal flap; **B**, glandular resection; **C** and **D**, fixation of dermal flap; **E**, restoration of conical shape.

Figure 2. Pre- and postoperative photographs demonstrating good mammary reduction, remodeling with short scars, and the recovered girth.

asked to score postoperative rate of satisfaction on a visual analog scale from 0 to 10. The highest possible level of satisfaction was 10. The overall evaluated follow-up period was six months.

Statistical Analysis

The statistical significance of the differences between mean values was determined using one-way analysis of variance (ANOVA) and Fisher's LSD; $p \leq 0.05$ was considered significant.

Results

The age distribution of the patients ranged from 17 to 65 years (mean, 45.7 yrs). The body mass index (BMI) evaluated in the last seven years was 27.4 kg/m^2 on average. 86 breasts (43 patients) had reductions of 1999 g or less and 94 breasts (47 patients) had reductions of 2000 g or more.

Preoperatively, the range of distance from the midclavicular point to the nipple was 33.4 to 53 cm. The mean resection weight was 1715 g (990-2825 g) for the right breast and 1670 g (1010-2427 g) for the left breast (Figures 2 and 3).

As expected, the large reduction group had larger preoperative midclavicular point-nipple distance and tended to be taller and weighed more. Patients of large reduction group were elder than the small reduction one.

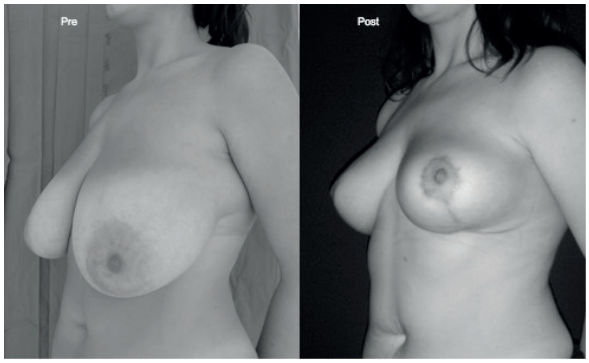

Figure 3. Pre- and postoperative photographs demonstrating good mammary reduction, remodeling with short scars, and the recovered girth.

There were no statistically significant differences in the rates of nipple necrosis, hematoma, seroma, wound dehiscence, wound infection, loss or reduction of nipple sensation, and a pathologic scar between the large and small resections. There was a lower rate of wound dehiscence and wound infection in the smaller resection group as compared with the large resection group, but no statistical difference was found. Four patients were culture-positive for the following organisms: *Staphylococcus species*, two breasts; *Pseudomonas aeruginosa,* one breast; *Streptococcus pyogenes*, one breast. These patients with clinical and laboratory evidence of infection received additional days of antibiotic coverage until negative culture swab.

Body mass index had no statistically significant effect on the rate of nipple necrosis, hematoma and seroma formation, nipple sensation, wound infection or hypertrophic scarring: patients with higher BMI values (≥ 35 kg per square meter) and lower BMI values (≤ 34.99 kg per square meter) had similar complication rates.

However, BMI had a statistically significant effect on wound dehiscence ($p \leq 0.05$): a higher mean BMI predicted wound dehiscence. Differences were statistically significant when considering the overall body mass index, although no significant difference was found when comparing the BMI-related wound dehiscence rate between small and large mammaplasty reduction groups.

Large reduction patients pointed higher mean satisfaction rate (9.3 ± 1.8) than small reduction patients (8.6 ± 2) ($p \leq 0.05$) (Figure 4).

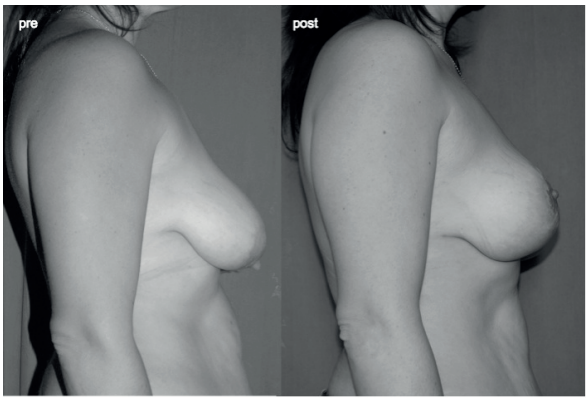

Figure 4. Pre- and postoperative photographs demonstrating good mammary reduction, remodeling with short scars, and the recovered girth.

Discussion

Brest hypertrophy is a debilitating condition both physically and emotionally. Historically, the most dependable procedure for this condition was free nipple grafting[12]. However, newer evidence in surgery has shown that nipple transposition in conjunction with pedicle-based reductions can achieve even better results[12,13]. Although these new findings, reported complication rates vary widely and there is controversy as to whether or not there is an increased complication rate with increased tissue resection per breast[8,9].

The main objective of this work was to determine whether the rates of complications and patients satisfaction are higher in large reductions (≥2000 g per breast) as compared with some reductions (≤1999 g per breast), using a custom-made technique that uses a superior dermal flap, combining the advantages of round block and vertical scar.

To better evaluate these rates, we retrospectively reviewed a population of 90 patients who underwent reduction mammaplasty; we subdivided the population into two groups, fixing the crossover point between small and large reductions at 2000 g of excised tissue per breast. We choose this point following a simple cut-off already described by Chang et al[8] and then reviewed by O'Grady et al[9]. Even if these authors studied the complication rate in large and small inferior pedicle reduction mammaplasty, we found this method really simple and reliable, fitting also the evaluation of other pedicle-based techniques.

Some previous papers[8,9,13,19] have focused on the common complications associated with reduction mammaplasty and some scholars have examined patient satisfaction of both inferior and superior pedicle techniques. Although these reports, complications, particularly wound problems, remain relatively common as well as satisfaction rate varies grossly among different studies.

Analysis of the demographic data reveals that women who require larger reductions tend to be taller, weighed more, have a larger BMI consistent with obesity, and have significantly more ptotic breasts. Our findings demonstrate that, in addition to the majority of potential complications, partial or total nipple loss is not significantly increased in reductions of greater than or equal to 2000 g.

The rate of wound dehiscence was reduced by both smaller reduction and lower BMI. A higher mean BMI predicted wound dehiscence when considering the overall population. Conversely, no significant difference was found when comparing the BMI-related wound dehiscence rate between small and large mammaplasty reduction groups. This probably is owing to split-up of the population, reducing the number of patients in each group and therefore the statistical significance.

Mean overall satisfaction with the operation was excellent, and patients reported that they definitely would recommend the operation. Large reduction mammaplasty scored higher satisfaction rate ($p \leq 0.05$). Patients with large breast can benefit greatly from a reduction in breast size, as most symptoms deeply influence physical, social and psychological life: women who undergo reduction mammaplasty have a functional improvement in musculoskeletal pain, headaches, sleep, and breathing. Psychological benefits are vast and include improved self-esteem, sexual function, and quality of life, in addition to less anxiety and depression. It has been shown as this improvement could vary proportionally with the dimension of breast reduction performed[20-22].

Conclusions

In this study we described a reduction mammaplasty that combines advantages of the round block and vertical scar techniques, employing a superior dermal flap that sustains the breast tissue and avoids herniation and flattening. We demonstrated that this technique could be used for breasts ranging from mild to severely hypertrophic with various degrees of ptosis, with the advantage of a short scar. This custom technique, tailor-made for each patient, achieved a successful aesthetic outcome with minimal scarring and high satisfaction rate for both small and large breast reduction.

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Conflict of Interest

The Authors declare that they have no conflict of interests.

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