

Correction of Bilateral Nipple-Areola Complex Malposition with Invisible Scar after Nipple-Sparing Mastectomy: A Case Report

Paolo Bogetti, Antongiulio Mangia*

Department of Surgical Sciences, Reconstructive and Aesthetic Plastic Surgery, AOU Città della Salute e della Scienza, University of Turin (Italy), Italy

***Corresponding author:** Antongiulio Mangia MD, Department of Surgical Sciences, Reconstructive and Aesthetic Plastic Surgery, AOU Città della Salute e della Scienza, University of Turin (Italy), Via Cherasco 23, 10126 Turin, Italy

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Abstract

Nipple malposition after Nipple-Sparing Mastectomy (NSM) is relatively common, with an incidence rate ranging from 14% to 75%. Risk factors of Nipple-Areola Complex (NAC) malposition include incision placement, breast ptosis, prior radiation therapy or lumpectomy, breast size and implant-based reconstruction. Although several NAC correction surgery procedures have been proposed in the literature, these inevitably result in enhanced scarring and are associated with a greater risk of NAC ischemia. Here, we report a case of correction of vertical NAC malposition following bilateral NSM in large, asymmetric ptotic breasts, resulting in invisible scarring of the Inframammary Folds (IMFs) without affecting NAC vascularization.

Level of Evidence:

Level V

Keywords: Nipple-Sparing Mastectomy; Nipple-Areola Complex Malposition; Surgical Treatment of Nipple Malposition

Introduction

Nipple-Sparing Mastectomy (NSM) is an increasingly common surgery for breast cancer as it allows complete preservation of the Nipple-Areola Complex (NAC) with superior aesthetic results and oncologic outcomes. However, besides increasing the risk of NAC necrosis, NMS can often result in NAC malposition, an unwanted effect occurring during breast reconstruction with either tissue expanders or autologous tissue flaps [1,2]. In this regard, in a series of 26 patients undergoing NSM with implant-based reconstruction with predominantly lateral incisions, Wagner et al. reported that 75% of patients experienced vertical NAC malposition ranging from extremely or moderate far inferiorly or superiorly [3]. Although the etiology of this phenomenon is not entirely known, it is most likely related to the skin adhesion to the pectoralis major muscle and contracture of the skin during the latency period of expansion [4].

A number of studies have proposed that factors such as preoperative ptosis, large volume resection, periareolar incision with lateral extension and high body mass index may all increase the risk of NAC malposition [4-6]. Multiple techniques have been

described for correcting NAC malposition, including periareolar skin excision, pocket adjustments, pedicle nipple transposition flaps and free nipple grafting. However, these techniques often add visible scars and are associated with a greater risk of NAC ischemia [2].

This study describes a case of vertical NAC malpositioning correction following bilateral NSM in large, asymmetric ptotic breasts, resulting in invisible scarring at the level of the Inframammary Fold (IMF) without compromising NAC vascularization.

Case report

A 30-year-old female suffering from bilateral breast cancer of the lower pole was admitted to our Reconstructive and Aesthetic Plastic Surgery Unit at AOU Città della Salute e della Scienza, Turin, Italy, for bilateral NSM with immediate expander breast implant reconstruction. Preoperatively, Magnetic Resonance Imaging (MRI) had revealed the presence, in the right breast, of an extensive ductal carcinoma *in situ* of 8 cm in size, localized between the lower-inner and lower-outer quadrants at a distance of 6.4 cm from the nipple. In addition, in the left breast MRI had shown an invasive carcinoma of 4.8 cm in size, localized between the lower-inner and lower-outer quadrants at 5.9 cm from the nipple. For both breasts, no axillary node involvement had been detected.

Preoperative Nipple-to-Inframammary Fold Distance (NIF) was measured with the patient in a standing position. Preoperative view revealed a large to moderate right breast ptosis, with a sternal notch-to-nipple distance of 25 cm and the nipple is positioned 2 cm below the crease (Figure 1).

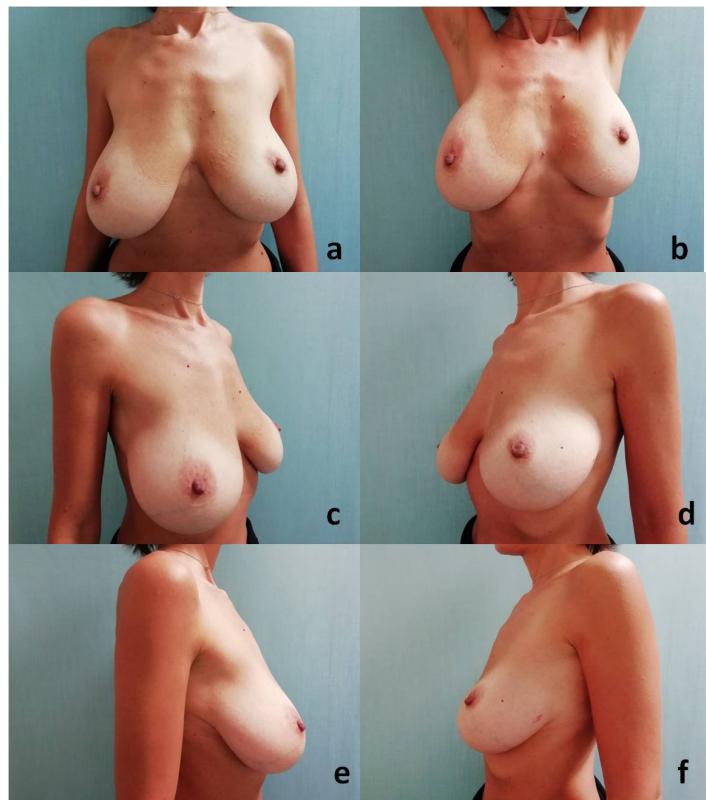


Figure 1: A 30-year-old female with bilateral breast carcinoma of the lower pole underwent bilateral NSM with immediate expander breast implant reconstruction. The preoperative view showed a large and moderate right breast ptosis (grade II) and a large left breast pseudoptosis (grade I). Preoperative frontal view (a, b). Preoperative oblique view (c,d). Preoperative lateral view (e,f).

Moreover, it was noticed a consistent left breast pseudoptosis, with an sternal notch-to-nipple distance of 21 cm and the nipple localized at the level of the IMF (Figure 1). The breast surgeon performed NSM using lateral horizontal incisions, with the patient receiving intravenous antibiotics within 30 min of surgical incision (cefazolin 1 g i.v.). Since retroareolar biopsies resulted negative for carcinoma, both NACs were left in place. For each breast, an anatomical breast expander was inserted in the submuscular pocket so that the caudal inferior border of the pectoral muscle would be released from the ribs, maintaining continuity with the superficial abdominal fascia. The lower end of the pocket was then completed by mobilizing the serratus muscle.

Tissue expanders were filled intraoperatively with 200 cc of saline solution in order to achieve tensionless closure of the mastectomy skin flaps as well as of the junction of the pectoralis major and serratus muscles. Subsequently, two surgical drains were placed in each breast: one in the submuscular pocket and the other at the level of the inframammary fold within the submastectomy flap pocket. A postoperative bra was applied to the patient, and drains were removed once individual drain output was less than 20 cc/day (1 week postoperatively). Expansions were performed at 1- or 2-week intervals until the preferred volume of 450 cc was attained in two months.

Once fully expanded, the postoperative view showed upward rotation of the NAC with “bottoming out” and “star-gazing” phenomena (Figure 2). As for the second surgery, IMF incisions were performed, tissue expanders were removed, and anatomical cohesive gel implants were placed in the submuscular pockets. In order to correct vertical nipple malposition, an elliptical wedge excision was performed removing 5.5 cm from the lower pole of the right breast and 4 cm from that of the left side (Figure 3).



Figure 2: After mastectomy, tissue expanders were fully expanded over a two-month period. The postoperative view showed upward rotation of the nipple-areola complex (NAC) with “bottoming out” and “star-gazing” phenomena.

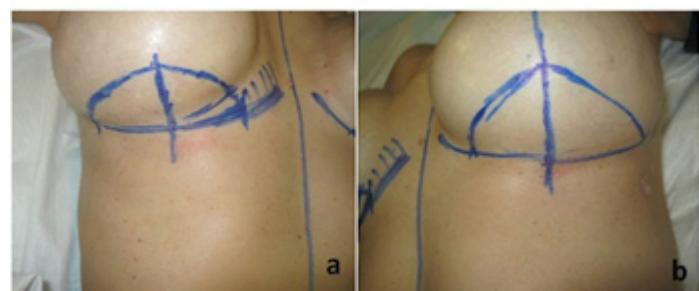


Figure 3: With the aim of repositioning the NACs, in the second operation IMF incisions with elliptical wedge excisions were performed removing 5.5 cm from the lower pole of the right breast (a) and 4 cm from that of the left breast (b).

At the end of the initial reconstruction, both NACs were finally secured in the desired position to the patient's satisfaction. NAC positions were assessed at 1, 3 and 6 months and 1 year postoperatively (Figure 4), with no signs of complication or nipple distortion.

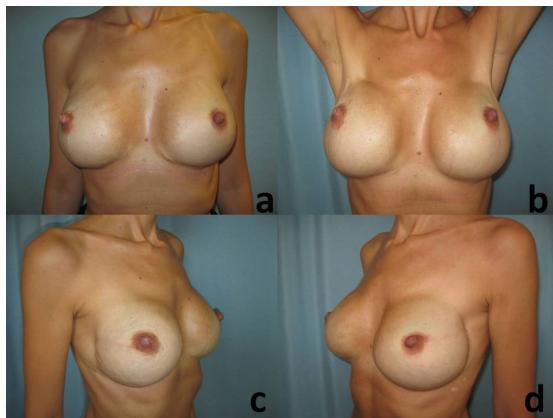


Figure 4: One-year postoperative view showed correction of vertical NAC malposition with NACs secured in the desired position (i.e. sternal notch-to-nipple distance of 21 cm, with nipple at the level of inframammary-fold, bilaterally). Postoperative frontal view (a, b). Postoperative oblique view (c,d).

Discussion

According to Regnault's classification, the term "pseudoptosis" defines a breast configuration where the gland is inferior to the IMF, whereas the nipple is above the latter. Grade I ptosis is diagnosed when the nipple is positioned 1 cm below the crease, while a diagnosis of grade II ptosis is made when the nipple is localized 1 to 3 cm below the crease. Finally, grade III ptosis is diagnosed if the nipple is below the crease at a distance of more than 3 cm, or it is localized in the inferior pole of the breast [7].

Some authors suggest that in patients predisposed to nipple malposition due to large and ptotic breasts (i.e. grade II and III breasts) the choice of the incision during NSM plays a crucial role in preventing this unwanted event. For example, in patients who cannot delay mastectomy due to breast cancer and therefore cannot perform a mastopexy as first step, mastectomy with vertical incision in the lower pole appears to be their best option to avoid nipple malposition [8].

Even though our patient was at high risk for nipple malposition due to a wide right breast with moderate ptosis (grade II), lateralized NAC and asymmetry compared to the left breast with pseudoptosis (grade I), vertical access to perform NMS in the lower poles was not possible due to the presence of two large carcinomas in the lower pole of both breasts.

Thus, we considered performing Skin-Reducing Mastectomy (SRM) as alternative surgical option for our patient. According to Nava, et al. [9], criteria for SRM include the following: 1) medium-sized or large ptotic breasts; 2) sternal notch-to-nipple distance > 25 cm; and 3) areola-to-IMF distance > 8 cm. Although our patient displayed sternal notch-to-nipple and areola-to-IMF distances of, respectively, 25 cm and 11.5 cm on the right breast, and of 21 cm and 9 cm on the left breast, we could not create viable dermal flaps because in both breasts the skin had been substantially thinned during NSM. This is particularly important in light of the main limitation of this technique due to the two long superior flaps allowing closure of the IMF often become ischemic because of their length and thinness, especially in pendulous breasts with empty upper poles, as in our case. This could then result in healing complications of the inverted-T scar, such as superficial epidermolysis, wound dehiscence and implant exposure [9,10].

Thus, we chose a technique that would allow us, after complete skin expansion, to access the IMF submuscular pocket in order to replace the skin expander with a definitive prosthesis and remove the horizontal cutaneous wedge to correct NAC malposition while leaving an invisible scar on the IMF and reducing the risk of NAC dehiscence and necrosis. Alternatively, we could have repositioned the NAC through cutaneous mastopexy. However, this technique would have compromised the residual periareolar dermal vascularization after NSM, increasing the risk of partial or total necrosis of NAC or resulting in prosthetic implant exposure.

Overall, the surgical procedure described in this study is highly recommended for cases of large ptotic breast where it is not possible to perform NSM in the lower pole through vertical access or where SRM is contraindicated.

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Conflict of Interest: Paolo Bogetti and Antongiulio Mangia declare that they have no conflicts of interest.

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This article does not contain any studies with human participants or animals performed by any of the authors. For this type of study informed consent is not required

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