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CASE REPORT
Breast

A Novel Immediate Nipple Reconstruction Technique in Oncoplastic Breast Surgery: Inverted Lotus Bud Flap

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Summary: Oncoplastic surgery is widely popular due to its ability to achieve curative tumor resection and symmetry of both breasts, and as a result of reduced psychological distress after mastectomy. Immediate nipple reconstruction was discussed and the gold standard procedure is inconclusive. Immediate nipple reconstruction with simultaneous breast reconstruction provides satisfactory esthetic results, compared with the delayed procedure. The "inverted lotus bud flap" was demonstrated as a new technique for immediate nipple reconstruction. The advantage of this technique is adequate nipple projection with minimization of scarring. In conclusion, oncoplastic breast surgery with immediate nipple reconstruction was demonstrated to be a safe and esthetically reliable procedure, leading to reduced psychological distress. This single-stage procedure promotes psychosocial well-being after breast cancer surgery. Immediate nipple reconstruction using the "inverted lotus bud flap" technique is versatile, reliable, and offers good esthetic results. *(Plast Reconstr Surg Glob Open 2020;8:e3260; doi: 10.1097/GOX.0000000000003260; Published online 3 December 2020.)*

Oncoplastic surgery is widely popular due to symmetry of both breasts and reduced psychological distress after mastectomy. Nipple-areola complex (NAC) reconstruction is traditionally performed as a second-stage procedure.[1] However, the gold standard technique for nipple reconstruction is inconclusive; in particular, immediate reconstruction is still discussed.

Herein, I report a case of invasive ductal carcinoma where oncoplastic breast surgery was performed. Furthermore, a new technique for immediate nipple reconstruction using an "inverted lotus bud flap" is demonstrated.

CASE REPORT

A 48-year-old woman presented with a palpable mass measuring 2 × 2 cm on the left breast, under the NAC. The left axillary lymph node measured 1 cm after palpation. Bilateral grade 2 ptosis was shown. The suprasternal notch to nipple distance was 26 cm in the left breast and 26.5 cm in the right breast; mid-clavicular point-NAC distance was 26.5 cm in both breasts; the nipple-inframammary fold (IMF) distance was 12 cm in both breasts; the right NAC diameter was 5.0 cm, and the left NAC diameter was 5.5 cm (Fig. 1).

Diagnosis was invasive ductal carcinoma (IDC) in the left breast, with bilateral ptosis. Left central lumpectomy and axillary lymph node dissection were performed. Reduction/mastopexy with an inverted T-incision and inferior dermoglandular pedicle was performed in the right breast. Inverted T-skin resection was performed in the left breast to achieve symmetry of both breasts. Immediate nipple reconstruction with an "inverted lotus bud flap" was established (Figs. 2–3). No post-operative complications were observed. Postoperative adjuvant chemo-radiation was given. Post-operation 6 months showed satisfactory results (Fig. 4). (**See Video [online],** which demonstrates immediate nipple reconstruction using an "inverted lotus bud flap," along with oncoplastic breast surgery.)

Operative Technique

The new nipple size was measured from the contralateral nipple after reduction/mastopexy in the right breast was completed. New nipple projection and diameter were designed equal to 1.2 times larger than the contralateral

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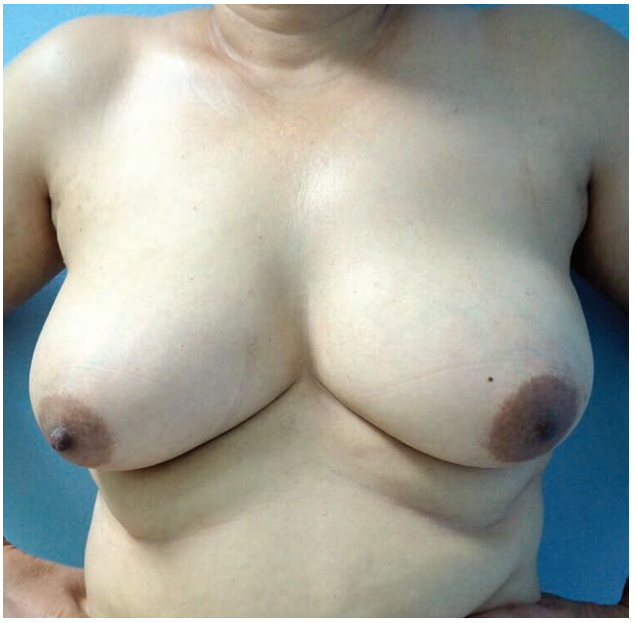

Fig. 1. Preoperative image showing bilateral grade 2 breasts ptosis with a mass located in the left breast under the NAC.

nipple size, to prevent postoperative loss of nipple projection. "Inverted lotus bud flap" design is shown in Figure 2. The suprasternal notch to upper border of right nipple distance was equal to the suprasternal notch to base of flap on the left side. Circumference of a nipple was equal to πX ($\pi = \frac{22}{7}$; X = nipple diameter) and equal to the distance between point a1 past base of flap to point a2 (Fig. 3). The 2 arms of the "inverted lotus bud flap" were raised along with the skin and subcutaneous tissue and up together to create a new nipple. It was random flap and blood supply was received from subdermal plexus. The de-epithelialized triangular area at the tip of the flap maintained the strength under the nipple and was closed primarily.

Fig. 2. An "inverted lotus bud flap" was designed on the left breast after central lumpectomy with an inverted T-incision and an inferior dermoglandular pedicle.

DISCUSSION

Oncoplastic breast surgery aims to achieve curative tumor resection and improved esthetic outcomes after breast cancer surgery.[2,3] Immediate nipple reconstruction is discussed, based on the unpredictable stabilization of the breast mound and correct positioning of the nipple.[4] However, immediate nipple reconstruction with simultaneous breast reconstruction provides satisfactory esthetic results, promotes psychosocial well-being after breast cancer surgery, and prevents poor skin quality after radiotherapy.[1,4]

Goals for nipple reconstruction include symmetry, size, shape, and minimal donor-site morbidity.[5] Optimal nipple reconstruction technique must be simple and reliable. Donor sites should be closed primarily and scars should be confined within the newly-reconstructed NAC.

Many techniques have been developed to maintain long-term nipple projection, including autologous cartilage, bone grafts, and artificial dermis.[6,7] Nevertheless, the gold standard method, especially with respect to the postoperative loss of nipple projection, is inconclusive. Previous studies have shown that a decrease in nipple projection occurs during long-term follow-up (which varied between 25% and 75% over 6 months).[5] Many factors, such as the lack of natural anatomic infrastructure, centrifugal forces under the reconstructed nipple, and wound contracture were considered.[3,5] I presented the "inverted lotus bud flap" as a nipple reconstruction option using the de-epithelialized triangular area to maintain the strength under the nipple and results to only one vertical scar in the inferior portion.

Partial or total nipple necrosis is uncommon after nipple reconstruction (<2%). Nipple reconstruction after radiotherapy has increased complication rates; hence, it is recommended that nipple reconstruction should be performed before radiotherapy.[5] Combination of autologous and immediate NAC reconstruction for patients who are not being considered for radiotherapy has been reported.[8]

Some reports have shown that immediate nipple reconstruction was "very important" in 86.6% of patients.[9] Patients who had a longer time interval between breast mound and NAC reconstruction reported poorer overall levels of satisfaction.[10]

Postoperative NAC tattooing is the common and easy method. However, only 6.9% of patients who underwent nipple reconstruction were tattooed.[1] My patient was satisfied with the outcome and refused to be tattooed.

This report demonstrated a new technique for immediate nipple reconstruction, the "inverted lotus bud flap." I designed the scar of the flap donor site in the inferior portion of the nipple; so the "lotus bud" turned to be inverted. The de-epithelialized area was maintained to strength under the nipple. However, loss of nipple projection has been shown to have a minimal impact on overall patient satisfaction.[1] Immediate nipple reconstruction using this technique prevented vascular compromise and poor skin quality from irradiated

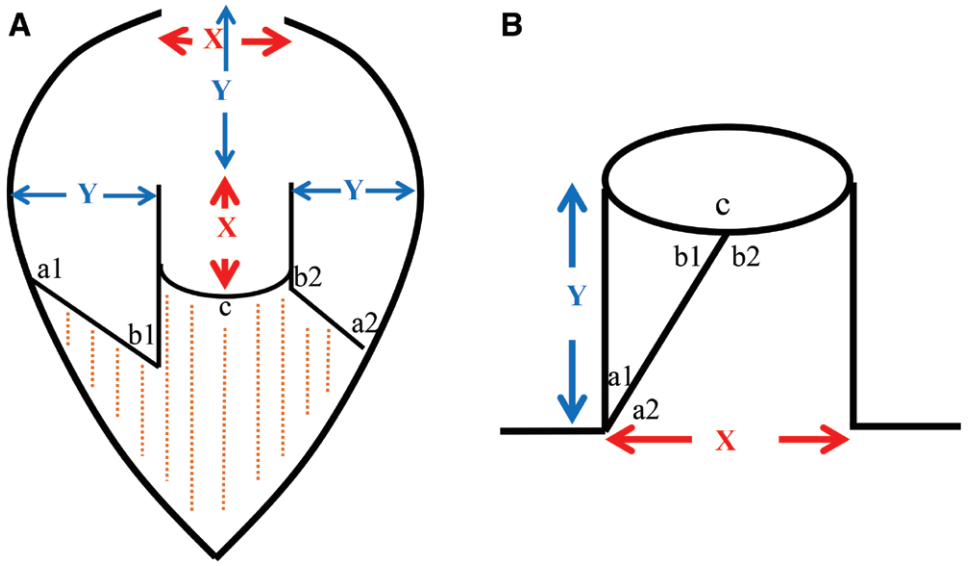

Fig. 3. A, Schematic diagram of the "inverted lotus bud flap," which was designed and measured starting from the contralateral nipple: X, 1.2 times the diameter of the contralateral nipple; Y, 1.2 times the projection of the contralateral nipple. Brown dotted lines represent the de-epithelialized area; B, the illustrated figure, showing the final outcome.

Fig. 4. Six months postoperative front-view image showing approximate symmetry of the breast contour and nipples between both breasts.

skin during delayed reconstruction. A possible change in the nipple's position after radiation had to be discussed with the patient. Advantages of this technique include single-stage procedure, adequate projection, and scar minimization. Long-term follow-up and more case series are required to assess the final outcome and calculate the extent of over-correction of the nipple. According to the lack of consensus for nipple reconstruction, the "inverted lotus bud flap" is an alternative method; hopefully, the gold standard will be established in the future.

CONCLUSIONS

Oncoplastic breast surgery with immediate nipple reconstruction and contralateral reduction/mastopexy were demonstrated to be safe and esthetically reliable, leading to reduced psychological distress. This single-stage procedure promotes psychosocial well-being after breast cancer surgery. Immediate nipple reconstruction using the "inverted lotus bud flap" technique is versatile, reliable, and offers good esthetic results.

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