

An optimized technique for all quadrant oncoplasty in women with small- to medium-sized breasts

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Abstract. – BACKGROUND: Oncoplastic surgery is a method to extend the possibility of breast-preserving surgery that can avoid breast deformities and reduce both mastectomy and re-excision rates. Round-block mammoplasty is reported as an alternative method in mammary reductions.

AIM: In this study, the round-block mammoplasty was modified and presented as a better surgical choice for all quadrant-located cancers in small- to medium-sized breasts with good aesthetic results.

PATIENTS AND METHODS: From June to December 2011, 30 patients with T1-T2 breast lesions that were candidate for breast conserving surgery underwent this kind of surgery.

RESULTS: Only half of breast skin envelope development was necessary compared to conventional round-block mammoplasty techniques. Those excised specimens weighed 35 g on average, with the biggest one measuring 7x6x3 cm in a medium-sized breast without deformity. No drains were placed after surgery and only one patient had a seroma formation that needed to be aspirated. Half-breast dissection between the glandular tissue and subcutaneous fat instead of whole breast dissection is enough to reach a good operative field, lower the possibility of post-operative seroma and decrease the amount of operation time. To avoid the nipple areolar complex widening, a monofilament purse-string suture was used to reduce its diameter. Besides, radiation therapy did not affect the cosmetic outcome after a short-term follow-up.

CONCLUSIONS: Compared to whole breast dissection, half-breast dissection between glandular tissue and subcutaneous fat is enough to reach a good operative field, lowers the possibility of post-operation seroma and reduces the operation time. This method is recommended to be used to help improve the cosmetic results of breast surgery.

Key Words:

Breast-conserving surgery, Breast cosmetic, oncoplasty, Round-block mammoplasty.

in the reports by Veronesi et al¹ and Fisher et al² in 2002. The long-term survival rate among women who undergo breast-conserving surgery is the same as that of women who undergo radical mastectomy. One study compared psychosocial adjustment, body image, and sexual function in women who had breast conservation surgery for early-stage disease and found that the choice of local treatment had little psychosexual impact³. However, the key to successful breast-conserving surgery is to provide both an adequate margin and a good shape to the breast. From the perspective of oncologic safety, the largest specimen should be removed in an attempt to achieve the widest possible margin; from the perspective of aesthetics, the least amount of tissue excised yields a better cosmetic outcome. A breast deformity will occur if a large-sized partial breast is excised without being covered by a breast flap mastopexy. Oncoplastic surgery was proposed to resolve this problem, and was first mentioned in 1997 by Gabka et al⁴ to expand the indications spectrum for BCS of breast carcinoma. Oncoplastic surgery can extend the possibility of BCS, avoid breast deformities and reduce both mastectomy and re-excision rates. Clough et al⁵ developed an atlas and guideline for oncoplastic surgery in order to help in patient selection and choice of optimal surgical procedure for breast cancer patients undergoing BCS. Silverstein⁶ also suggested a series of oncoplastic techniques for different tumor locations, and pointed out that donut or mastopexy can be applied in any segment of the breast. In 1990, Benelli⁷ proposed a new periareolar mammoplasty, a round-block technique applied in several types of breast surgery such as ptosis or hypertrophy, and hypotrophy and tumor excision. In tumor excision, this technique produced a discreet scar and a more regular breast contour. In all types of mammoplasty, the main goal is to limit the scar. This round-block technique is suitable for tumor excision in small- to medium-sized breasts with periareolar lesions. Those with very large and ptotic/fatty breasts or a lot of additional skin were

Introduction

Breast-conserving surgery (BCS) as a treatment option for breast cancer was well established

contraindicated for this technique⁸. De-epithelialization is fundamental in performing this technique; these procedures were introduced earlier by plastic surgeons when performing reduction mammoplasty^{9,10}. Here, the existing round-block mammoplasty was modified and presented as a better surgical choice for all quadrant-located cancers in small- to medium-sized breasts with good aesthetic results.

Patients and Methods

From June to December in 2011, 30 patients with T1-T2 lesions were enrolled for this kind of surgery. The enrolled criteria of this study are as follows: (1) breast cancer patients who were candidates for breast conserving surgery; (2) tumor size was no more than 3 cm in moderate to small sized breast; and (3) the tumor was not centrally located as well as not for fatty breasts. Our Institutional Review Board approved this study and required neither patient approval nor informed consent for the review of medical records. All these cases were operated by a single surgeon. The patients' images were used in this study under the patients' consent. The information concerning the personal identity had been removed from those images.

Among those 30 patients, tumor size ranged from 1.5 to 2.6 cm at different locations and 2 to 6 cm apart from center of nipple. The periareolar-located breast cancers were in all quadrants in small- to medium-sized breasts. The procedures began by making two concentric periareolar incisions around one cm wide, followed by de-epithelialization of the overriding skin.

The distal edge of the de-epithelialization was incised around the skin and subcutaneous envelope for the performance of mastectomy. The nipple areolar complex (NAC) remained vascularized by its posterior glandular base as well as the surrounding dermis. This procedure ensured the blood supply from the surrounding dermis to the NAC (Figure 1A). Once de-epithelialization was complete, the distal edge of the de-epithelialization was incised around the skin and subcutaneous envelope in preparation for performing mastectomy. There was no need to develop a whole breast subcutaneous envelope; half-breast dissection was enough to obtain a good operative field to proceed with the wide excision of the tumor and glandular tissue re-approximation (Figure 1B); furthermore, to ensure the viability of a glandular flap. Quadrant resection of the breast parenchyma was per-

formed from one side, using the index finger beneath and the thumb above the tumor in order to feel the border of the tumor. Accessing the feasibility of glandular re-approximation is easy using an elliptically shaped glandular resection. To the patient with a 5x3 cm cancer located at an 8-10 o'clock position (Figure 1C-F), full thickness-wide excision was performed with a 7x5 cm en-bloc specimen.

Results

In this small series, only one out of 30 cases had seroma formation and required repeat aspirations. An average of 35 g of excised specimen was obtained; the biggest one measured 7x6x3 cm in a medium-sized breast without deformity (Figure 2A and B). Radiation therapy did not affect the aesthetic outcome (Figure 2C-F). All surgical margin statuses of these 30 patients were clear by at least more than five mm, except one patient with a close margin less than one mm. A re-excised specimen showed negative for malignancy in the margin. Two out of five patients with an interrupted peri-areolar suture had NAC scar widening, but none occurred using a monofilament purse-string suture in the subsequent 25 cases (Figure 3).

Figure 4 showed an upper inner quadrant-located lesion. After ultrasound-guided localization (nonpalpable lesion, 1.3 cm), a hemi-breast subcutaneous-parenchymal dissection was done. Figure 5 demonstrated a peripheral lesion with a fatty breast. A racquet mammoplasty was used instead of a mammoplasty. A sentinel node biopsy was done through the quadrantectomy cavity upwardly. The cosmetic result was good without fat necrosis. The breast size of Asian women is usually not as large as that of Caucasian women. For tumor sizes over three cm, a standard lumpectomy would have lead to poor cosmesis.

Discussion

With the technique, the sensation and blood supply of the NAC are well preserved, since the subdermal plexus is maintained by de-epithelialization¹¹. According to our initial experience, this technique is a single technique that can be used for all quadrant oncoplasties in Taiwanese women with small-to-medium-sized breasts.

Compared to peri-areola type of incision, round-block incision obtained much wider oper-

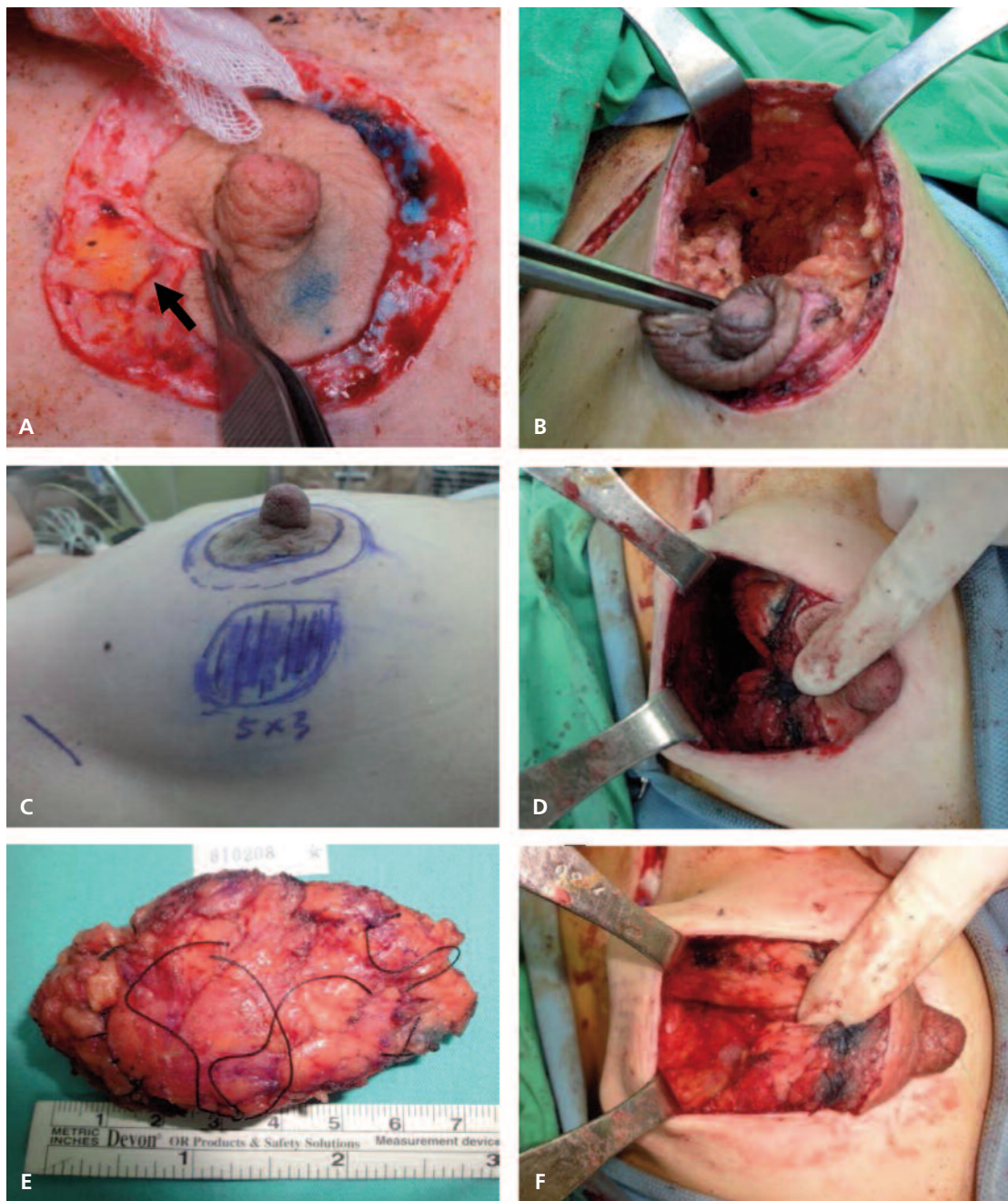


Figure 1. (A) De-epithelialization ensures the blood supply from the surrounding dermis to the NAC (arrowhead). The NAC remains vascularized by its posterior glandular base as well as the surrounding dermis. (B) There was no need to develop a whole breast subcutaneous envelope — half-breast dissection is enough to obtain a good operative field to proceed with the wide excision of the tumor and glandular tissue re-approximation. (C-F) A patient with a 5x3 cm cancer located at the 8-10 o'clock position; full thickness wide excision was performed with a 7x5 cm en-bloc specimen.

ation field especially for those patient with small areola that facilitate to reshaping of breast. Special caution is needed when considering BCS for lesions in the upper inner quadrant of the breast. In this quadrant, less parenchymal

tissue is needed to fill the excised cavity. For moderate resections, this technique can be utilized safely. In this created operative field, lumpectomy with a wide-margin excision and subsequent parenchyma re-approximation can



Figure 2. Pictures with good aesthetic results. *(A,B)* Immediately after surgery. *(C,D)* After radiation therapy. Radiation therapy did not affect the aesthetic outcome after round-block mastopexy. *(E)* Front view. *(F)* Side view.

easily be performed without much dual-plane undermining. BIRADS (Breast Imaging Reporting and Data System) density classification is very important in determining whether a level I or II oncoplastic technique is used⁵. This qualitative description of the breast density introduces large intra-observer and inter-observer

variations in the estimated classification, thus obtaining generally different qualitative descriptions¹². The fatty breast (BIRADS 1) is not appropriate for extensive dual-plane dissection when a level I oncoplastic technique is used. Skin excision as well as full thickness glandular excision might optimize wide margins and yield

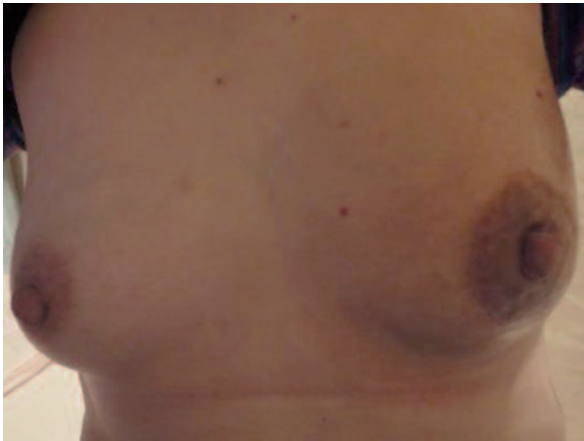


Figure 3. NAC scar widening in the left breast with round-block mammoplasty.

fewer complications such as fat necrosis or glandular necrosis.

Careful hemostasis is important. A hematoma might easily be formed where the dissection has

taken place. A surgical clip was inserted into the excised cavity subsequently to facilitate radiation therapy. No drainage is necessary to lessen a drainage scar and delay hospitalization. NAC scar widening and changes in areolar shape represent a common problem with this technique. A monofilament purse-string suture is used to reduce the diameter of the NAC, and no interrupted suture is used in order to avoid NAC widening. Another trick to avoid widening of the circum-areolar scar is to keep the width of the donut skin excision within 20 mm⁸. In 2006, Az-zawi and Humzh¹³ proposed a modified Benelli technique with de-epithelialization and a double suture to preserve the shape of the areola.

Conclusions

Round-block mammoplasty is reported as an alternative method in mammary reductions. It was modified and presented as a good surgical



Figure 4. After ultrasound-guided localization (nonpalpable lesion, 1.3 cm) *(A)*, a hemi-breast subcutaneous-parenchyma dissection was done *(B)*. In this created operative field, lumpectomy with a wide-margin excision and subsequent parenchymal re-approximation can easily be performed without much dual-plane undermining *(C,D)*.

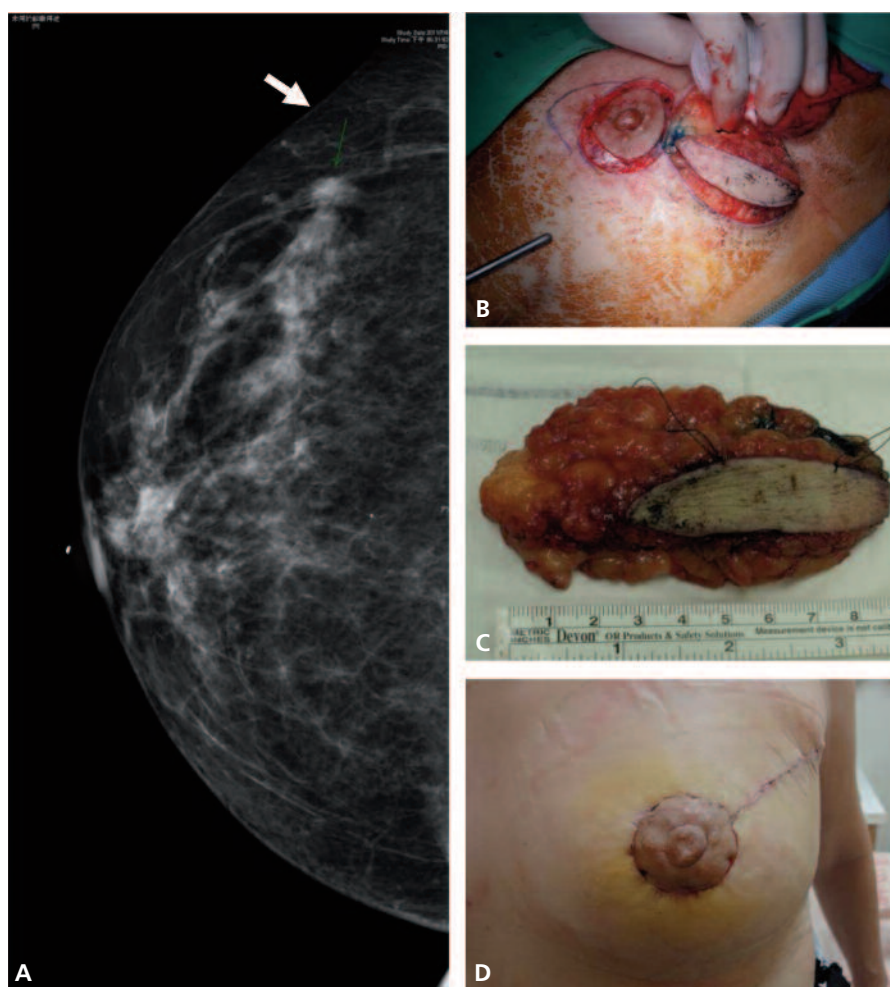


Figure 5. (A) A peripheral lesion with a fatty breast. (B) A racquet mammaplasty was used instead of round-block mammaplasty. (C) The specimen measured 9x4x2.5 cm, and weighed 49 gm. (D) Sentinel node biopsy was done through the quadrantectomy cavity upwardly. The final cosmetic result was good without fat necrosis.

choice for all quadrant-located breast cancers in small- to medium-sized breasts with good aesthetic results. Oncoplastic surgery is a new approach for extending BCS possibilities. For a breast surgeon, there might be little difficulty in performing these procedures and this technique should be learned in order to help improve the cosmetic result of breast surgery. However, patient selection was important to prevent possible complications.

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Conflict of Interest

The Authors declare that there are no conflicts of interest.

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