B-plasty technique as an approach for lateral breast tumors

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Background
Breast-conserving surgery (BCS) has better cosmetic outcome over mastectomy without interfering with the oncological outcome. Wide local excision of a lateral breast mass may lead to disfigurement of the final shape and symmetry with lateralization of the nipple–areola complex.
Patients and methods
Between March 2017 and March 2019, 40 cases with lateral breast tumors were divided sequentially into two groups; group A had conventional BCS, while group B had BCS with the B-plasty technique.
Results
The mean age of group A cases was 47.9±9.1 years while in group B, it was 48.8 ±14.2 years. The mean tumor size in group A was 2.2±0.94 cm, while in group B it was 2±0.83 cm with no statistically significant difference between two groups as regards age and tumor size. We reported wound seroma in eight (40%) cases in group A and one (5%) case in group B. The postoperative cosmetic score was good in seven (35%) cases in group A while in group B, it was good in 15 (85%) cases with statistically significant difference between both groups in favor of group B as regards wound seroma and cosmetic outcome.
Conclusions
B-plasty is a simple approach for lateral breast tumor with safe oncological and satisfactory aesthetic outcomes.

Keywords:
breast cancer, breast-conserving surgery, breast cosmesis, oncoplasty

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Background

Breast cancer is the most common malignant neoplasm in women. With the advancement of community awareness against breast cancer and the employment of screening programs and diagnostic modalities, early detection of breast cancer increased, which allows more improvement of the morbidity and mortality [1].

The trend of surgical strategy of curative treatment of breast cancer shifted over the last decades from radical resection toward more conservative resection of the tumor preserving the aesthetic and the oncological outcomes of the patients [2,3].

The aim of the oncoplastic surgery for breast cancer is to improve the cosmetic outcome without affecting the oncological principles of breast cancer resection. Oncoplastic breast surgery consists of two components, wide local excision of the tumor in association with breast reshaping [4,5].

The upper outer quadrant (UOQ) of the breast is the most common site of breast cancer with an incidence of 60% and an average of 10% in the lower outer quadrant (LOQ) [6]. Wide local excision of outer quadrant breast tumors may result in poor cosmetic outcome in the form of lateral displacement of the nipple–areola complex (NAC) while the B-plasty technique in lateral breast tumors offers safe resection with better cosmetic outcome [7].

Patients and methods

It is a prospective comparative study that was done between March 2017 and March 2019. This study was conducted at Ain Shams University Hospitals and was approved by the General Surgery Department ethics committee. It included 40 patients with lateral quadrant breast cancers divided sequentially into two groups.

Group A: 20 patients underwent wide local excision (the conventional method).

Group B: 20 patients underwent wide local excision with the B-plasty technique.

The technique was discussed with all patients and informed written consent was obtained.

Inclusion criteria

(1) Female patients.
(2) Early breast cancers (≤T2, M0).
(3) Lateral quadrant masses.

Exclusion criteria

(1) Contraindications for conservative breast surgery (such as inflammatory breast cancer, male breast, patient refusing conservative surgery, contraindication to radiotherapy, multicentricity, and recurrent breast tumors).
(2) Central or inner quadrant masses.
(3) Major ptosis.
(4) Tumor–breast size ratio that does not allow oncoplastic surgery.

The aim of our study was to evaluate the oncological and aesthetic outcomes of B-plasty technique as an oncoplastic technique in lateral quadrant breast tumors.

Preoperative workup

(1) All patients were diagnosed as breast cancer by triple assessment; clinical examination (to confirm that all cases of two groups had the same tumor–breast size ratio excluding any cases with a large size of tumor in relation to breast size), sonomammography, and tru-cut needle biopsy of the breast mass and MRI for invasive lobular carcinoma cases to exclude multicentricity.
(2) Metastatic workup to confirm early stage of the tumor was done in the form of bone scan, computed tomography scan of the chest, abdomen, and the pelvis with contrast.
(3) All cases were discussed by the multidisciplinary team approach for the possibility of preoperative neoadjuvant chemotherapy.

Operative technique

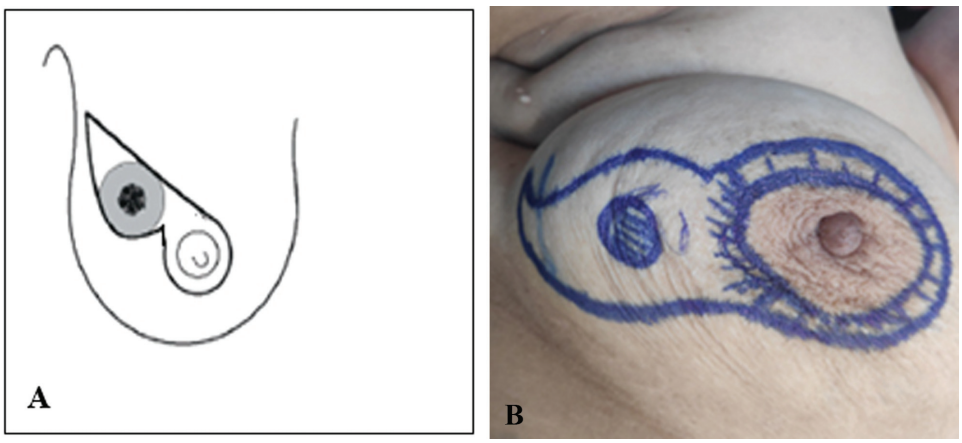
All cases were operated on by the same surgical team under general anesthesia. The first step of the B-plasty is preoperative drawing in two positions, the sitting upright and revised in lying position in the operation theater immediately before surgery.

The drawing was started by marking the mass at the lateral quadrant of the breast and then circular marking at the areolar margin and 2 cm around it but not completed at the lateral side, then the periareolar mark was extended laterally passing above and below the marked mass (about 2–3 cm around it) in a crescent (half-moon) shape. So, the final shape of the mark is B-shaped (Fig. 1).

The procedure was started by de-epithelialization of the marked peri-aerolar area (Fig. 2). Then excision of the mass was achieved with a safety margin (including the zone between a,b,,) until the pectoral fascia (including it) and a wedge of tissue is excised from underneath the NAC for oncological purpose and to facilitate mobilization of the breast tissue during wound closure (Fig. 3).

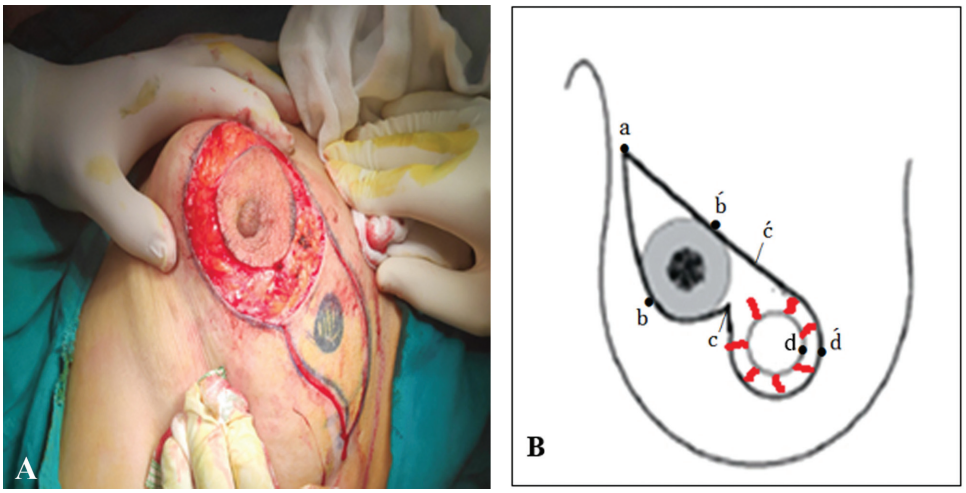
Frozen section was performed to confirm negative safety margins and then axillary dissection for zones II and III was done from the same wound (Fig. 4).

Figure 1



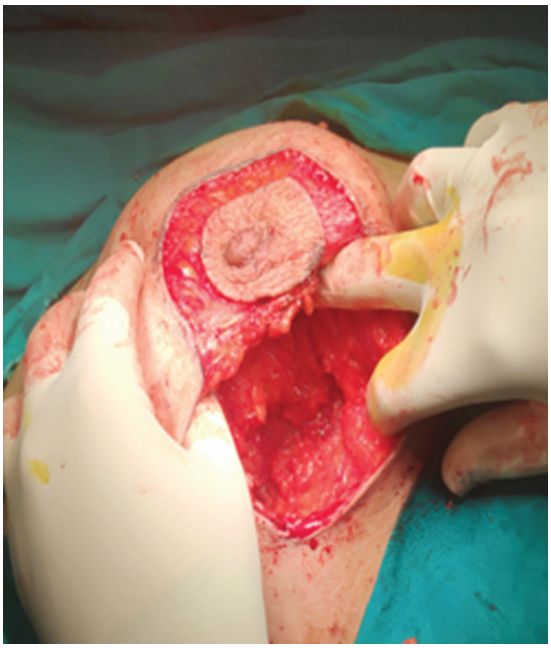
B-shaped drawing.

Figure 2



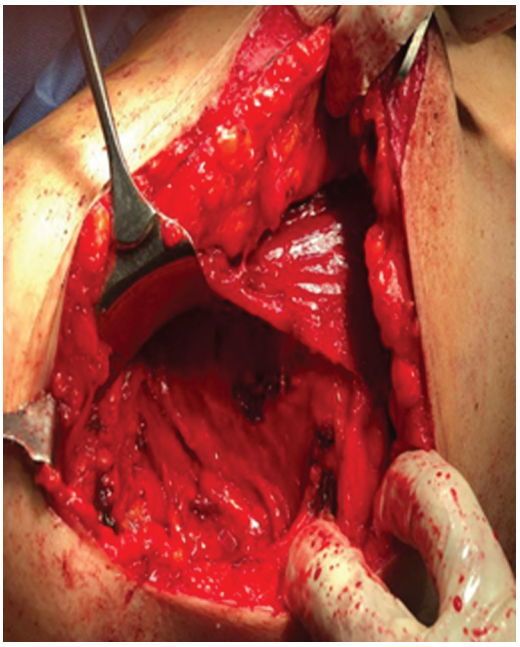
Periareolar de-epithelization.

Figure 3



WLE of the mass. WLE, wide local excision.

Figure 4



Axillary dissection.

Then mobilization of the upper and lower glandular flaps of zone (a,b,,c,) was done followed by closure of the defect in two layers using Vicryl 2/0 sutures starting from point (a) (lateral angle) then b with then c with . Suction drain was inserted, and closure of the periareolar skin to the areolar margin was done starting approximation of d to (so, medialization of NAC). Then closure of the periareolar skin and lateral defect skin in a subcuticular manner using 4/0 monocryl sutures was done (Fig. 5).

In the conventional method, wide local excision was done through a crescentic incision along Langer's line followed by excision of the mass with a safety margin confirmed by a frozen section and then closure of the defect in two layers over the suction drain.

Postoperative care

(1) Follow-up of all patients for vital data and drain output in the ward for 24 h and then after discharge in our outpatient clinic.
(2) Suction drain was removed when the output decreased to 20–30 ml/24 h.
(3) All patients were referred to clinical oncologists for adjuvant treatment.

Figure 5

Closure of the wound.

Table 1 Aesthetic scoring system [4]

Parameters	Assessment		
	Good	Fair	Poor
Symmetry	2	1	0
Breast shape	2	1	0
Scarring	2	1	0
Position of the NAC	2	1	0

NAC, nipple–areola complex.

(4) The two groups were compared as regards intraoperative blood loss, operative duration, and postoperative complications (seroma, hematoma, wound infection, and flap necrosis).
(5) Aesthetic outcome was evaluated at the 6 month postoperatively by an objective and subjective scoring system (Table 1) [4].
(6) Then we added patients' satisfaction for the scoring system with score 2 (2 if good, 1 if fair, 0 if poor). The final outcome is considered good if more than or equal to 9, fair if 6–8, and poor if less than or equal to 5.
(7) Oncological outcome was evaluated by the negative margin of the resected mass by the frozen section and confirmed by the postoperative paraffin section and follow-up for recurrence (local and systemic) for 2 years postoperatively by tumor markers (CA15-3), breast sonomammography, and if any suspicious finding by clinical or radiological examination, MRI was done.

Results

Our prospective study included 40 female patients with lateral breast cancer operated between March 2017 and March 2019 at Ain Shams University Hospital. Patients were divided into two groups:

Group A: 20 patients underwent conventional breast-conserving surgery (BCS).
Group B: 20 patients underwent BCS with the B-plasty technique.

As regards patients and tumor characteristics, the age of group A ranged from 30 to 60 years with a mean of 47.9±9.1 SD and in group B, it ranged from 20 to 66 years with a mean of 48.8±14.2 SD. As regards tumor location in group A, the tumor was located at the UOQ in 16 (80%) cases and in four (20%) cases, the tumor was located at the LOQ, while in group B, the tumor was located at UOQ in 15 (75%) cases while in five (25%) cases, it was located at the LOQ.

In group A, the tumor size ranged from 0.9 to 4 cm with a mean of 2.2±0.94 SD while in group B, it ranged from 0.5 to 3.8 cm with a mean of 2±0.83 SD with no statistically difference between two groups. More patient and tumor characteristics of both groups are shown in Table 2 with no statistically significant difference.

As shown in Table 3, the mean operative time in group A was 133.6±12.25 min while in group B, it was 139.65±17.9 min with no statistically significant difference between both groups.

The mean blood loss in group A was 64.5±20.83 ml while in group B, it was 77±27.16 ml with no statistically significant difference between both groups.

As regards postoperative data, there was only one (5%) case in group A which was presented by postoperative wound infection while in group B, there were no cases with wound infection with no statistically difference between both groups.

Eight (40%) cases complained of wound seroma in group A in comparison to one (5%) case in group B with statistically significant difference between both groups in favor of group B.

One (5%) case in group A had wound hematoma while no cases in group B had hematoma with nonstatistically significant difference between both groups. There were no cases with flap necrosis in both groups.

Table 2 Comparison between the two groups as regards patients and tumor characteristics

	Groups [mean (*n*)±SD (%)]		*P*	Significance
	Group A (conventional) *N*=20	Group B (B-plasty) *N*=20		
Age (years)	47.9±9.1	48.8±14.2	0.813*	NS
Tumor pathology				
IDC	18±90	19±95	1.0**	NS
ILC	2±10	1±5		
Tumor size (cm)	2.2±0.94	2±0.83	0.584*	NS
Tumor grade				
G1	2±10	1±5	0.738**	NS
G2	15±75	17±85		
G3	3±15	2±10		
Preoperative chemotherapy				
Yes	9±45	11±55	0.752**	NS
No	11±55	9±45		
pT stage				
T1	8±40	6±30	0.741**	NS
T2	12±60	14±70		
pN stage				
N0	3±15	2±10	0.824**	NS
N1	10±50	12±60		
N2	7±35	6±30		
Tumor location				
UOQ	16±80	15±75	1.0**	NS
LOQ	4±20	5±25		

ILC, invasive lobular carcinoma; LOQ, lower outer quadrant; UOQ, upper outer quadrant. *Student's *t* test. **Fisher's exact test.

Table 3 Comparison between the two groups as regards operative and postoperative characteristics

	Groups [mean (*n*)±SD (%)]		*P*	Significance
	Conventional	B-plasty		
Operative time (min)	133.6±12.25	139.65±17.9	0.221*	NS
Blood loss (ml)	64.5±20.83	77±27.16	0.111*	NS
Time to drain removal (days)	14±2.88	9±1.95	0.001*	S
Hospital stay	1 day			
Infection				
Yes	1±5	0±0	1.0**	NS
No	19±95	20±100		
Seroma				
Yes	8±40	1±5	0.02**	S
No	12±60	19±95		
Hematoma				
Yes	1±5	0±0	1.0**	NS
No	19±95	20±100		
Flap necrosis	No flap necrosis			
Recurrence	No recurrence			
Cosmetic score				
Good	7±35	15±75	0.036**	S
Fair	7±35	3±15		
Poor	6±30	2±10		
Nearest margin (cm)				
0.5–1	3±15	0±0	0.231**	NS
>1	17±85	20±100		

*Student's *t* test. **Fisher's exact test.

Hospital stay was 1 day for all cases. Time of suction drain removal in group A ranged from 10 to 21 days with a mean of 14 days while in group B, it ranged from 7 to 14 days with a mean of 9 days with significant statistical difference between two groups in favor of group B.

Figure 6

(a) Preserved bilateral symmetry after closure. (b, c, d) Final shape after 6 months.

Figure 7

Disfigurement and lateral squint in conventional BCS. BCS, breast-conserving surgery.

As regards the oncological outcome in our study, the surgical margin of specimens was free in all cases in both groups. The nearest margin in group A was 0.5–1 cm in three (15%) cases and more than 1 cm in 17 (85%) cases while in group B, the nearest margin in all cases was more than 1 cm with no statistically significant difference between both groups.

There was no recurrence (local or systemic) within 2 years of follow-up in all cases of both groups.

As regards aesthetic outcome, the cosmetic score in group A was good in seven (35%) cases and poor in six (30%) cases, while in group B, the score was good in 15 (75%) cases, fair in three (15%) cases and poor in two (10%) cases with statistically significant difference in favor of group B (Figs 6 and 7).

Discussion

The female breast is considered the most consequential symbol of femaleness. So, the aesthetic outcome and

final shape of the breast after any resectional surgery is the first concern for a woman [8].

Based on this point, the surgical management of breast cancer was shifted from radical surgery to BCS. And to improve the cosmetic outcome after breast surgery (whatever partial or total resection), oncoplastic surgical techniques have emerged and are expanding dramatically [9,10].

Most of breast cancers are UOQ lesions [11]. Conventional BCS in lateral breast tumors (especially in large tumor to breast size ratio) may interfere with the cosmetic outcome mainly due to lateral deviation of NAC. And so, oncological outcome (to keep enough clear surgical margin) may interfere with cosmetic outcome especially if wider resection is needed [12].

Our study aims to discuss the oncological and aesthetic outcomes of the B-plasty reconstruction technique over conventional BCS in lateral quadrant breast tumors.

The B-plasty technique was originally described by Rengault to excise tumor in all quadrants [13]. Many modifications on the Rengault technique have been done by ScandRoof. B-plasty technique is indicated in noncentral tumor with medium-sized and large-sized breast without major ptosis. The principle of this technique is glandular displacement (medially) of the bulky lateral breast tissue to fill the defect and prevent the lateral squint of NAC [7,14].

In our study, the B-plasty technique in lateral quadrants tumors allows complete excision of the mass with large enough safety margin and no re-excision was needed with no recurrence (local, systemic) within 2 years of follow-up. So, this technique kept the oncological outcome.

Besides that, the cosmetic outcome of this technique was optimum and significant (good score in 75% in comparison to 35% in conventional BCS) mainly due to preventing the lateralization of NAC thus preserving the shape of the breast with relatively symmetrical both sides. The cosmetic difference between two groups was significantly different. In the Scandroof study, more than 75% of cases had good or very good scores in their cosmetic scores with no recurrence cases [7].

We noticed in our study that the seroma rate in B-plasty was 5% less than the seroma rate in conventional B-plasty (40%) and this difference was statistically significant. We suggest that the difference is due to major glandular displacement in B-plasty (in comparison to conventional BCS) which allows better filling of the defect.

Conclusion

B-plasty technique is a simple technique with an excellent cosmetic outcome for those with lateral breast masses without affecting the oncological principle in comparison to the conventional BCS.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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