A comparative study between round block technique and standard wide local excision in patients with breast cancer

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Background
The purpose of optimizing the cosmetic and oncological results of breast conservative surgery (BCS) has been addressed in recent years by the advent of the field of oncoplastic surgery, originally defined as an assortment of volume replacement techniques. Recently, the concept of oncoplastic surgery has been expanded to include a wide range of volume-displacement or volume-transfer procedures performed by breast surgeons and general surgeons to improve breast shape and breast volume during breast cancer operations.
Aim
The aim was to assess the round block technique regarding oncological safety, surgical outcomes, and patients' satisfaction and to compare the results with standard wide local excision.
Patients and methods
This is a prospective randomized trial to test the round block technique as an oncological procedure for the early management of breast cancer near the nipple–areola complex in terms of oncological safety, surgical outcomes, and patients' satisfaction and to compare the results with standard wide local excision. A total of 20 patients with breast cancer were subdivided into group A, which comprised 10 female patients who underwent round block technique, and group B, which comprised 10 female patients who underwent standard wide local excision. Patient and tumor criteria, including age, comorbidities, tumor size, and distance between tumor and nipple-areola complex, were considered to be nonsignificant between the two groups, so the only difference is the surgical technique.
Results
The round block technique and standard wide local excision (SWLE) have the same results regarding operating time, intraoperative blood loss, and postoperative complications, with radiation of breast therapy (RBT) being advantageous because of its better cosmetic outcomes and lower re-excision rates.
Conclusion
Despite no evidence of increased surgical complications, the round block procedure has equivalent operating parameters to SWLE. In round block, patients were found with lower re-excision rates and better cosmoses, as a scarless procedure, without nipple and areola shift, which indicates that the round block technique is superior to selected SWLE.

Keywords:
breast cancer, round block technique, standard wide local excision

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Introduction

The most common cancer among women is breast cancer all over the world, representing 18% of all women with reported cases of cancer. It represents the leading cause of women mortality, as representing 23% of all women cancer deaths [1].

According to the National Cancer Institute, breast is the most common cancer site among women in Egypt, accounting for approximately 38.8% of total malignancies among Egyptian women; it is a significant cause of mortality among women [2].

Breast cancer diagnosis is based on history collection, clinical evaluation of both the primary tumor and the regional lymph node, imaging tests, and medical pathological confirmation. The breast cancer stage is assessed according to the TNM framework, which depends on the case of primary tumor, regional lymph nodes, and remote metastasis [3].

After breast cancer has been diagnosed, the woman finds herself in a new and unknown environment. This causes various stress rates, which vary from patient to patient [3].

This stress is triggered not only by death but also by the surgical treatment of breast cancer that can affect her view of her physical, emotional, and sexual wholeness dramatically and sometimes permanently [4].

However, breast-conserving techniques remained as a partial mutilation, where asymmetries and deformities were not considered relevant, as oncological outcomes were more important than psychological and aesthetic damage [5].

The development of the field of oncoplastic surgery in recent years has tackled the goal of enhancing the cosmetic and oncological outcomes of breast-preserving surgery. Initially, oncoplasty surgery was defined as a range of volume replacement procedures performed by plastic surgeons to remove partially or fully resected breasts [6].

However, now it involves the use of plastic techniques to achieve tumor resection with safety margins ensuring good cosmetic results and symmetrizing contralateral breast surgery if appropriate; the technique used depends on many factors such as tumor position, size, breast tumor ratio, and preferences of patients [7].

It has been reported that round block technique, also known as Benelli or Doughnut mastopexy, is a useful oncoplastic technique for women with comparatively smaller breast size and minimal ptosis who do not require the symmetry of contralateral breast surgery. As a significantly less complex procedure compared with other oncoplastic procedures, the round block can pose less possible oncoplastic surgical complications [8].

Aim

The aim of this work was to assess the round block technique regarding oncological safety, surgical outcomes, and patients' satisfaction and to compare the results with standard wide local excision.

Patients and methods

Type of the study

This is a prospective randomized study to test the round block technique as an oncological procedure for early breast cancer treatment in the vicinity of the nipple–areola complex in terms of oncological health, surgical outcomes and patient satisfaction and to compare the results with standard large local excision.

Study settings

This research was performed at the Department of General Surgery, Ain Shams University Hospitals, and the Faculty of Medicine Helwan General Surgery. Ethical Committee approval was obtained, and written informed consent was provided by all participants.

This study depended on simple random sampling by closed envelope technique, and the required sample was subdivided into two groups: group A included 10 female patients who underwent round block technique as an oncological procedure for management of early breast cancer near to nipple–areola complex, and group B included 10 female patients who underwent standard wide local excision. The results regarding oncological safety, surgical outcomes, and patients' satisfaction were compared between the two groups.

Diagnosis and staging examinations were carried out according to the standard protocol being conducted at Ain Shams and Helwan University Hospitals.

Patient selection was achieved through a number of following inclusion and exclusion criteria:

Inclusion criteria

(1) Female patients having an age range from 20 to 60 years.
(2) Early breast cancer stage I and II.
(3) Tumors within 4 cm from nipple and areola complex.
(4) Tumor-free margins obtained.
(5) Downgraded tumors after neoadjuvant chemotherapy.

Exclusion criteria

(1) Tumors away from nipple and areola complex more than 4 cm.
(2) Central tumors that involve nipple and areola complex.
(3) Advanced breast cancer T3 and T4 not responding to neoadjuvant chemotherapy.
(4) Inflammatory breast cancer.

(5) Multicentric or multifocal carcinoma.
(6) Distant metastasis.
(7) Inability to achieve tumor-free margins.
(8) History of previously treated ipsilateral breast cancer or patients with previously irradiated breast.
(9) Patients who have an absolute contraindication for adjuvant radiotherapy were excluded by their history.
(10) Patients who were not convinced with proposed procedure after adequate explanation or demanded mastectomy for fear of local recurrence.
(11) Patients refusing post-operative adjuvant radiotherapy.
(12) In the same environment, patients undertaking other reconstructive procedures were omitted from the study, as this would eventually extend the time of operation.
(13) All patients were subjected to history taking, including full personal history, compliant, analysis of their disease, along with thorough medical and family history with its relevance to the condition, and also complete clinical examination in the outpatient clinic that included general condition assessment and local breast examination.

Preoperative investigations included the following:

(1) Radiological investigations, including bilateral digital mammography in at least two views (craniocaudal and mediolateral oblique), chest radiography, and pelviabdominal ultrasound (US) as part of our metastatic workup protocol.
(2) US-guided tissue biopsy using true-cut needle core biopsy from breast lump in all patients was indicated.
(3) Laboratory tests, including complete blood count, liver profile, kidney profile, coagulation profile, and random blood sugar.
(4) ECG and echocardiography were performed upon requested by the anesthesiologists when indicated.

Multidisciplinary team

A multidisciplinary team at the breast unit at General Surgery Department of both Ain Shams and Helwan University reviewed every single case independently. The multidisciplinary team (MDT) included breast surgery consultants, pathology consultants, plastic surgery consultants, radiology consultants, and medical oncology consultants. Discussion was held upon every case, including her history, examination, and investigations, until a decision was tailored for every case.

Patient counseling and consent

After admission and completion of history and examination, each patient received a detailed explanation of her condition regarding the disease itself, the type of surgery, and expected postoperative adjuvant therapy. Operative details of the selected technique for each patient were explained using pictures of similar cases to help visualization of the outcome and risks and benefits of the suggested procedure; moreover, the possible intraoperative and postoperative possible complications were also clearly stated and explained individually for each procedure, which included wound infection, fat necrosis, nipple and areola complex sloughing, asymmetry or failure of adequate cosmetic outcome, incidence of local recurrence, also the change of the strategy of the postoperative oncological management, the need for postoperative radiation dose to the remaining tissue of the breast, the resultant effect of this dose on the skin, and cosmetic outcome.

A formal written consent was obtained from each patient after explaining the study protocol to the patient. The consent was signed one day before the surgery, and any inquiries, concerns, or doubts were discussed with the patient and a first-degree relative (upon the patient's request).

Medical photography

The need for medical photography was also discussed and explained. How will the photography be taken and who is going to photograph her were also stated. Moreover, the reason of the photography was discussed, explained, and consented.

Medical photographs were taken and kept in the patient's records. Pictures were taken of the patients along their follow-up visits to keep record and document progress.

Operating room setup

Surgery was performed in the operating rooms of the Ain Shams and Helwan University hospitals.

Preoperative marking

Markup and design of planned incision were done on the morning of the surgery in the operation theater

holding area, in the presence of the breast nurse and the surgical team. Measurements were taken and maintained with the patient standing upright before receiving preanesthetic drugs. Drawings were made using waterproof skin markings.

The assistant keeps the breast firm, and the upper, lower, and side borders are labeled. This depends on the extent of the ptosis, the location of the tumor, and the size of the tumor.

Preoperative US wire-guided position for non-palpable tumors has been done.

In group A

Preoperative sketches included outer and inner incision lines, area between the incisions to be deepened, and 1–2-cm distance between the inner and outer incision lines, depending on the extent of the tumor, location, and position of the nipple. The more the breast volume to be removed, the more the ptosis to be fixed, and the greater the gap between the inner and outer incision lines.

In small tumors and breasts with identical nipple locations, the distance between the inner and outer incision lines should be as close as possible.

In the absence of ptosis, and in the case of a traditional breast symmetry before surgery, the lateral incisions should be roughly 1–1.5 cm away from the inner incision to keep the nipple–areola complex in the same position.

The upper border may be 2–3 cm away from the inner nipple–areola incision in the case of moderate ptosis, whereas the lower and lateral border may be 1–1.5 cm away from the inner incision line for raising the breast.

In cases with larger tumors and potentially greater defects, the distance between the two incision lines on the side of the tumor may need to be increased by up to 4 cm.

In group B

We marked the lump with an indelible marker on the skin before making the skin incision. The placement of the incision is determined by the location of the lump, either periareolar, inframammary, or circum–areolar incision.

A preoperative photography session is made now again for documenting the breast measurements and incision sites to help audit the final cosmetic outcome according to each patient and each breast size.

Surgical technique

General rules

(1) Patients were positioned in the supine position with arms separated at 90° for axillary access, with the option of placing the patient on the operating table for symmetry control.
(2) Intraoperative frozen segment analyses were done to ensure safe margins were achieved and to minimize the need for a second procedure. Specimen markings are achieved as follows: Superior margin is marked by short strand, lateral margin is marked by long strand, and deep margin is marked by double strands.
(3) The site of the resected tumor was marked by 4 titan clips at all margins for radiotherapy orientation to reduce radiation scattering.

In group A

Incision

In this procedure, two concentric lines were placed around the areola.

Dissection

A skin shield had been built around the NAC in all directions. With the same dissection used for a skin-saving mastectomy, the quadrant of breast tissue containing the intended lesion was completely exposed. The full thickness breast gland was then isolated from the underlying pectoral muscle and delivered via circumareolar incision. Part of breast tissue was resected with the tumor in a wedge-shaped fashion, with the tissue excision width needed to achieve sufficient surgical margins, balanced against the challenge produced by an oversized segmental deficiency. The specimen was then sent for intraoperative frozen section to evaluate the margins to ensure stable margins were obtained.

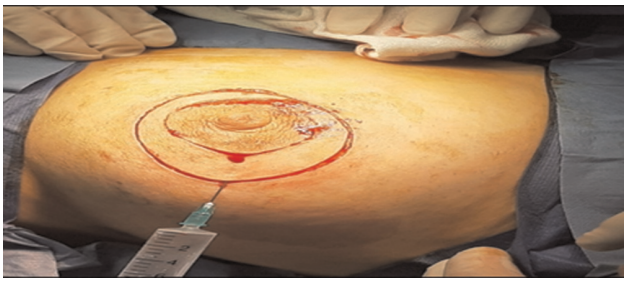
De-epithelialization

While we were waiting for frozen section result, a periareolar 'donut' skin island was de-epithelialized by separating this skin island from the underlying tissues; by taking care to avoid complete devascularization of the skin, we did not cut the dermis around the areola, but at the side of the tumor peripherally.

Closure

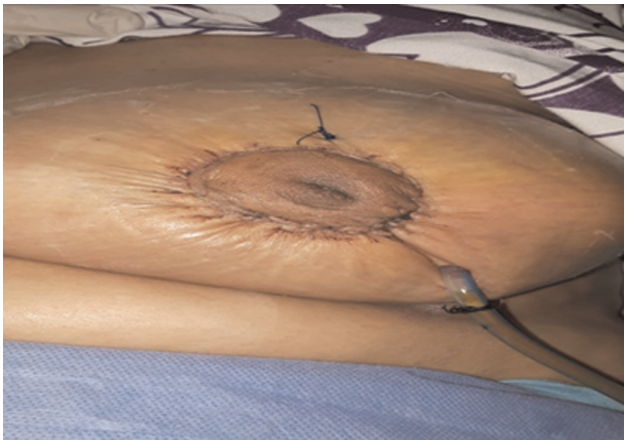
After the tumor was resected, the defect was closed by either approaching the lateral parenchyma with sutures or simply by mobilizing the lateral parenchyma by undermining the pectoral fascia and the parenchyma

Figure 1



Epithelialized by separating this skin island from the underlying tissues.

Figure 2



Closure of the wound by subcuticular suture and drain insertion.

between the skin and the breast; then, the remaining fibroglandular tissue is returned to the skin envelope, and the peripheral apical corners of the fibro glandular tissue were secured to each other and then anchored to the chest wall.

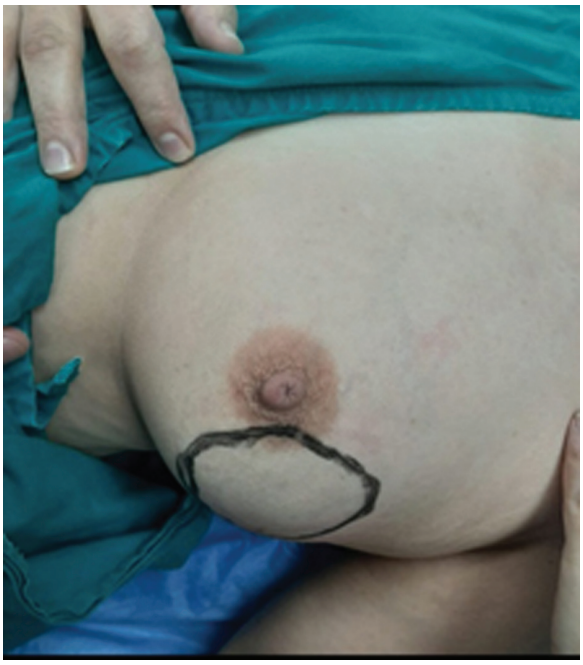
Placing radivac drain is not routinely done, but if there is a large dead space, we need to apply a radivac drain to avoid seroma collection that may predispose to infection. One limb is applied at breast wound and the other at the axilla.

A purse string was positioned around the opening of the isola using an absorbable 3–0 suture and is clamped at a scale that approximates the initial NAC. The suture of the purse string was attached, and subcuticular sutures were then used to close the wound (Fig. 1).

In group B

Standard wide local excision (SWLE) was performed via a periareolar approach, which is best suited and heals well with minimal scarring, or by an incision at a cosmetically pleasing spot, such as an inframammary or

Figure 3



Site marking of the tumor.

circumareolar incision, where a periareolar approach was not necessary.

Then we raised skin flaps all around the dimensions of the lump and at least one centimeter beyond, and then we excised the lump with a sufficient margin down to the pectoral muscle.

Placing radivac drain is not routinely done, but if there is a large dead space, we need to apply a radivac drain to avoid seroma collection that may predispose to infection. One limb is applied at breast wound and the other at the axilla.

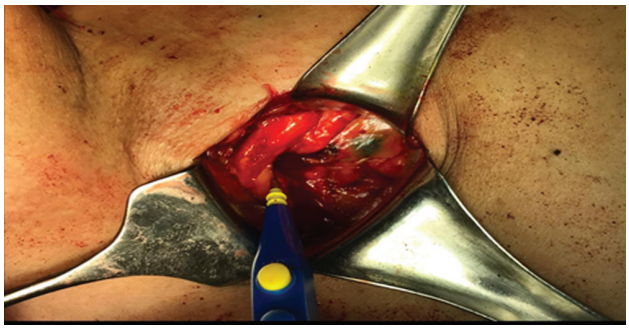
We closed the defect by mobilizing the surrounding breast tissue, and a few absorbable sutures were placed to approximate the cavity before closing the skin by 4-0 subcuticular sutures (Fig. 2).

Postoperative management

Inpatient postoperative recovery time was 24 h, unless in complicated cases or staying for medical co-morbidities. Prophylactic broad-spectrum antibiotics, including emoxiclav 1 g every 12 h and dalacin C 300 mg every 8 h, were administrated to all patients upon induction and during the whole period of hospital stay (Figs 3 and 4).

Postoperative pain and discomfort were encountered, and patients were given routine postoperative analgesia in the form of pethidine 50 mg after recovery from

Figure 4



Wide local excision of the tumor.

anesthesia followed by NSAIDs fixed dose every 8 h in the first 24 h and when needed after that.

All patients were discharged with a set of instruction and follow-up schedule after 24 hours, unless in complicated cases or staying for medical co-morbidities. Patients were discharged on antibiotics, analgesics, and antiedema agents.

Dressing once daily with betadine was done for all patients. Drains were removed in the follow-up visits when daily volume is less than 40–50 ml. Patients were instructed to undergo arm and shoulder mobilization and a set of exercises to avoid stiffness of the should joint and decrease arm edema after axillary surgery and were advised to wear well-fitting sport bra.

Follow-up

Patients were given a follow-up schedule upon discharge from the hospital as follows:

(1) After 2 days postoperatively for dressing and breast radivac removal.
(2) After 1–2 weeks for removal of axillary radivac drain and stiches and for assessment of cosmoses.
(3) After the final pathology report is available, patients were referred to the oncology department to start their adjuvant therapy.
(4) After radiotherapy, at 1 month for assessment of cosmoses.

Statistical analysis

Data were collected, revised, coded, and entered to the Statistical Package for the Social Sciences (IBM SPSS) version 23 (Statistical analysis was done using IBM SPSS statistics for windows, Version 23.0. Armonk, NY: IBM Corp). The distribution of quantitative data was tested by Kolmogorov–Smirnov test of normality. So, the quantitative data were presented as mean, SD, and ranges when parametric. Moreover, qualitative variables were presented as number and percentages.

The comparison between groups regarding qualitative data was done by using χ^2 test and/or Fisher exact test when the expected count in any cell is found less than 5.

The comparison between two independent groups with quantitative data and parametric distribution was done by using independent *t*-test.

The confidence interval was set to 95%, and the margin of error accepted was set to 5%. So, the *P* value was considered significant as follows:

(1) *P* value more than 0.05: nonsignificant.
(2) *P* value less than 0.05: significant.
(3) *P* value less than 0.01: highly significant.

Results

All 20 patients underwent two major technical steps: first, excision of the tumor with a wide safety margin through a pre-designed incision with frozen section examination for margins and axillary clearance, second, followed by immediate reconstruction.

Preoperative parameters, operative parameters, and postoperative parameters were collected.

Preoperative parameters

(1) Patient characteristics such as age, comorbidities, BMI, breast size, and neoadjuvant chemotherapy were recorded.
    (a) Tumor characteristics, tumor size, distance from nipple and areola complex, pathologic characteristics, and US-guided wire localization were assessed.
        (1) Patient characteristics
        The patients' demographics including age, comorbidities, BMI, breast size, and neoadjuvant chemotherapy were not significant in both groups (Table 1).
        (2) Age
        The age of the patients varied from 32 and 60 years old, with mean of 47.9 years and 49.5 years for groups A and B, respectively (Table 2).
        (3) Comorbidities

On preoperative patient preparation, full history taking and full laboratory investigations are done:

Table 1 Preoperative parameters of the study

	Group A [*n* (%)]	Group B [*n* (%)]	Test value	*P* value	Significance
Age					
Mean±SD	47.9±9.85	49.5±8.07	0.397•	0.696	NS
Comorbidities					
With Comorbidities	3 (30.0)	3 (30.0)	0.000*	1.000	NS
Without Comorbidities	7 (70.0)	7 (70.0)			
Comorbidities:					
HTN	1 (33.3)	1 (33.3)	1.333*	0.514	NS
DM	1 (33.3)	2 (66.7)			
IHD	1 (33.3)	0			
BMI					
Mean±SD	24.59±1.58	25.08±1.5	0.711•	0.486	NS
Breast size					
Mean±SD	c±1.42	c±1.16	0.000	1.000	NS
Neoadjuvant chemotherapy	4 (40.0)	3 (30.0)	0.220*	0.639	NS

DM, diabetes mellitus; HTN, hypertension; IHD, ischemic heart disease. *χ^2 test •Independent *t*-test. $P>0.05$, nonsignificant. $P<0.05$, significant. $P<0.01$, highly significant.

Table 2 Age categories of the study population

Age categories	Group A	Group B	Test value*	*P* value	Significance
20–29	0	0	0.000	1.000	NS
30–39	3 (30.0)	1 (10.0)	1.250	0.264	NS
40–49	2 (20.0)	3 (30.0)	0.267	0.605	NS
50–59	4 (40.0)	5 (50.0)	0.202	0.653	NS
60	1 (10.0)	1 (10.0)	0.000	1.000	NS

*χ^2 test.$P>0.05$, nonsignificant. $P<0.05$, significant. $P<0.01$, highly significant.

three patients among group A were found to have medical comorbidities, where one patient had diabetes mellitus, one patient had hypertension, and one patient had ischemic heart disease. They were matched with another three in group B to have medical comorbidities, where two patients had diabetes mellitus and one patient had hypertension.

Before the operation, these six patients were consulted to internal medicine and cardiology departments; an echocardiogram was done for the two patients with hypertension and the one who had ischemic heart disease. A cardiologist prescribed anti-hypertension medication and night sedation for them, and their recommendations were fulfilled.

BMI:

The BMI of the patients varied from 22.8 and 27.4 kg/m^2, with a mean of 24.59 and 25.08 kg/m^2 for groups A and B, respectively (Table 3).

Table 3 BMI categories of the study

BMI categories	Group A	Group B	Test value*	*P* value	Significance
18.5–22.9 (normal)	2 (20.0)	0	2.222	0.136	NS
23–27.4 (overweight)	8 (80.0)	10 (100.0)	2.222	0.136	NS
>27.5 (obese)	0	0	0.000	1.000	NS

*χ^2 test. •Independent *t*-test. $P>0.05$, nonsignificant. $P<0.05$, significant. $P<0.01$, highly significant.

Table 4 Number and percentage of the cases for every breast cup size in the study

Breast cup size	Group A [*n* (%)]	Group B [*n* (%)]	Test value*	*P* value	Significance
A	1 (10)	1 (10)	0.000	1.000	NS
B	1 (10)	0	1.053	0.305	NS
C	5 (50)	6 (60)	0.202	0.653	NS
D	1 (10)	1 (10)	0.000	1.000	NS
E	1 (10)	2 (20)	0.392	0.531	NS
F	1 (10)	0 (0)	1.053	0.305	NS
G		0	0.000	1.000	NS

$P>0.05$, nonsignificant. $P<0.05$, significant. $P<0.01$, highly significant. *χ^2test.

Breast size

The mean breast cup size for the whole study was C. The minimum breast cup size was A, whereas the maximum was F (Table 4).

Neoadjuvant chemotherapy:

In group A, four patients had received preoperative neoadjuvant chemotherapy to downgrade tumor stage after MDT consultation, whereas group B included three patients (Table 5).

Tumor characteristics:

Table 5 Tumor characteristics of the study

	Group A	Group B	Test value	*P* value	Significance
Tumor size					
Mean±SD	26±8.43	28.5±9.44	0.625•	0.540	NS
Distance from NAC (mm)					
Mean±SD	31.8±7.16	30.9±7.795	–0.269•	0.791	NS
US-guided wire localization	2 (20.0)	2 (20.0)	0.000*	1.000	NS

*χ^2 test. •Independent *t*-test. $P>0.05$, nonsignificant. $P<0.05$, significant. $P<0.01$, highly significant.

Table 6 Pathologic characteristics of the tumors in the study

Variables		Group A [*n* (%)] *n*=10	Group B [*n* (%)] *n*=10	Test value*	*P* value	Significance
Histologic type	Invasive ductal carcinoma	9 (90.0)	9 (90.0)	0.000	1.000	NS
	Ductal carcinoma in-situ	1 (10.0)	1 (10.0)			
Hormonal status and HER2 status						
ER	Positive	8 (80.0)	9 (90.0)	0.392	0.531	NS
	Negative	2 (20.0)	1 (10.0)			
PR	Positive	7 (70.0)	8 (80.0)	0.267	0.605	NS
	Negative	3 (30.0)	2 (20.0)			
HER2	Positive	2 (20.0)	3 (30.0)	0.267	0.605	NS
	Negative	8 (80.0)	7 (70.0)			
Tumor grade	I	1 (10.0)	2 (20.0)	0.410	0.815	NS
	II	7 (70.0)	6 (60.0)			
	III	2 (20.0)	2 (20.0)			
Lymph node status	pN0	8 (80.0)	6 (60.0)	0.952	0.329	NS
	pN1	2 (20.0)	4 (40.0)			

ER, estrogen receptor; HER2, herceptin receptor 2; PR, progesterone receptor. $P>0.05$, nonsignificant. $P<0.05$, significant. $P<0.01$, highly significant. *χ^2 test.

Tumor size

The tumor size was evaluated by US done for all cases before operation as an integral step of the triple assessment. The tumor size is evaluated along the longest diameter of the tumor mass. The mean tumor size was 26 and 28.5 mm in groups A and B, respectively.

Distance from NAC

The distance from the nipple areola complex was variable among the cases of the study; the nearest tumor was 20 mm from NAC, and the farthest was 40 mm from NAC.

US-guided wire localization:

Preoperative US-guided wire localization for nonpalpable tumors was done in two patients in group A and two patients in group B.

Pathologic characteristics:

The two groups also had comparable pathological parameters, with the majority of patients with invasive ductal cancer (Table 6).

Table 7 Operative parameters of the study

	Group A	Group B	Test value	*P* value	Significance
Operation time	111.1 ±17.10	107.6 ±18.64	–0.438•	0.667	NS
Patients needed blood transfusion	0	0	0.000	1.000	NS
Re-excision after frozen section result	0	4 (40.0)	5.000*	0.025	S

*χ^2 test. •Independent *t*-test. $P>0.05$, nonsignificant. $P<0.05$, significant. $P<0.01$, highly significant.

Operative evaluation (Table 7) included the following:

(1) Operation time.
(2) Intraoperative blood loss
(3) Intraoperative re-excision after frozen section result.

Operative time was evaluated in all of the 20 surgical procedures, from the beginning of the operation timed by skin incision until the end of the procedure marked by the end of skin closure. Our mean operation time was 111 min (1 h and 51 min) and 108 min (1 h and 48 min) for groups A and B, respectively.

Intraoperative blood loss

No patient required blood transfusion neither intraoperatively or postoperatively.

Intraoperative re-excision after frozen section result

It had happened in four patients in group B and did not occur with group A patients.

Postoperative criteria

The postoperative criteria were as follows:

(1) Postoperative hospital stay.
(2) Postoperative complication.
(3) Local recurrence.
(4) Cosmetic outcome.

Postoperative hospital stay

Both patient groups were admitted to the hospital for preoperative anesthesia consultation one day before the surgery and to fulfill all their laboratory workup and then discharged one to two days postoperatively once they were able to move and proceed to normal daily activities (Table 8).

Any patient who complained of postoperative pain or delay in movement were allowed to stay until they were able to leave. Most of the patients were discharged at the morning of the second day post-operatively (i.e. 24 h postoperatively) except five patients (two from group A and three from group B), who were discharged after 48 h postoperatively.

Postoperative complications

During the follow-up period, complications occurred as follows (Table 9):

Table 8 The mean postoperative stay for our study

Postoperative stay	Mean±SD	Median	Minimum	Maximum
A	28.8±10.12	24	24.00	48.00
B	31.2 ±11.593	24	24.00	48.00
Test value		0.493•		
P value		0.628 (NS)		

•Independent *t*-test. $P>0.05$, nonsignificant. $P<0.05$, significant. $P<0.01$, highly significant.

(1) Group A: complications occurred only in two patients in the form of hematoma formation.
(2) Group B: complications occurred only in two patients in the form of one case of infection and one cases of hematoma formation.

Other known complications like are edema, hypertrophic scar, keloid, and flap necrosis did not occur.

Local recurrence

In our study, none of the patients had any malignant recurrence during follow-up visits through 1 year after the surgical removal of the tumor, proving that we had performed both techniques safely from oncological point of view.

Cosmetic outcome

Cosmetic evaluation was done by the surgeon, the patient, and the breast MDT by postoperative photographs and then at 2 weeks and 1 month. Re-evaluation was done after completion of adjuvant chemotherapy and radiotherapy during follow-up. Documentation of radionecrosis, breast edema, and inflammation was done and managed according to its severity for the first 6 months after the surgery.

Patients' evaluation was done by means of scoring system of breast-Q questionnaire, graded from one to five, with one indicating very dissatisfying results and four indicating very satisfying results [13]. (Table 10).

The overall mean score of our study according to patients' evaluation was 68.4, which falls between very and somewhat satisfied for group A. In group B, it was 45.3, which falls between equivocal and somewhat dissatisfied (Table 11).

The cutoff score was 48; above it, the patient was considered satisfied, and below it, the patient was considered unsatisfied (Table 12).

The cosmetic outcome score was based on multiple items that made up a checklist to be evaluated by our

Table 9 Number and percentage of complications in our study

	A *N*=10	B *N*=10	Test value*	*P* value	Significance
Noncomplicated cases	8 (80)	8 (80)	0.000	1.000	NS
Complicated cases	2 (20)	2 (20)			
Hematoma	2 (100.0)	1 (50.0)	1.333	0.248	NS
Infection	0	1 (50.0)			

*χ^2 test.$P>0.05$, nonsignificant. $P<0.05$, significant. $P<0.01$, highly significant.

Table 10 BREAST-Q questionnaire (Cano *et al.*, 2011) [13]

	Very dissatisfied	Somewhat dissatisfied	Equivocal	Somewhat satisfied	Very satisfied
A. How you look in the mirror clothed?	1	2	3	4	5
B. The shape of your reconstructed breast(s) when you are wearing a bra?	1	2	3	4	5
C. How normal you fell in your clothes?	1	2	3	4	5
D. The size of your reconstructed breast(s)?	1	2	3	4	5
E. Being able to wear clothing that is more fitted?	1	2	3	4	5
F. How your breasts are lined up in relation to each other?	1	2	3	4	5
G. How comfortably your bras fit?	1	2	3	4	5
H. The softness of your reconstructed breast(s)?	1	2	3	4	5
I. How equal in size your breasts are to					
J. each other?	1	2	3	4	5
K. How natural your reconstructed breast (s) looks?	1	2	3	4	5
L. How naturally your reconstructed breast(s) sits/hangs?	1	2	3	4	5
M. How your reconstructed breast (s) feels to touch?	1	2	3	4	5
N. How much your reconstructed breast (s) feels like a natural part of your body?	1	2	3	4	5
O. How closely matched your breast are to each other?	1	2	3	4	5
P. How your reconstructed breast (s) look now compared to before you had any breast surgery?	1	2	3	4	5
Q. How your look in the mirror unclothed?	1	2	3	4	5

Table 11 Number of satisfied and unsatisfied patients in the two groups

Patient satisfaction	Group A [*n* (%)] *N*=10	Group B [*n* (%)] *N*=10	Test value	*P* value	Significance
Satisfied	9 (90.0)	4 (40.0)			
Unsatisfied	1 (10.0)	6 (60.0)	5.495*	0.019	S
Mean satisfaction score	68.4±5.6	45.3±11.8	-5.593	0.000	HS

*χ^2 test.•Independent *t*-test.$P>0.05$, nonsignificant.$P<0.05$, significant.$P<0.01$, highly significant.

Table 12 Patients' satisfaction categories in both groups

Satisfaction score	Group A	Group B	Test value	*P* value	Significance
Very dissatisfied	0	4 (40.0)			
Somewhat dissatisfied	1 (10.0)	2 (20.0)			
Equivocal	1 (10.0)	3 (30.0)	11.333	0.023	S
Somewhat satisfied	3 (30.0)	1 (10.0)			
Very satisfied	5 (50.0)	0			

S, significance.

team and the MDT of the breast for every single case (Table 13). This checklist included the following:

(1) The overall shape of the breast.
(2) The symmetry of both breasts.
(3) The site and direction of the nipple.
(4) The volume of the breast.
(5) The skin incision shape.

These elements were discussed for every single case and analyzed to give a scoring system graded from 1 to 5 as follows:

5=Excellent

4=Very good

Table 13 Cosmetic outcomes sheet for our team and MDT evaluation

	Poor	Fair	Good	Very good	Excellent
Overall shape of the breast	1	2	3	4	5
Symmetry	1	2	3	4	5
Site and direction of the nipple	1	2	3	4	5
Volume of the breast	1	2	3	4	5
Skin incision shape	1	2	3	4	5

MDT, multidisciplinary team.

3=Good

2=Fair

1=Poor

Table 14 Mean satisfaction score according to our team and MDT evaluation

	Group A [*n* (%)] *N*=10	Group B [*n* (%)] *N*=10	Test value	*P* value	Significance
Satisfying	10 (90.0)	6 (60.0)			
Unsatisfying	0	4 (40.0)	5.000*	0.025	S
Mean satisfaction score	20.5±3.5	16.7±4.3	2.167	0.044	S

MDT, multidisciplinary team; S, significant.

Table 15 MDT evaluation categories in both groups

Satisfaction score	Group A [*n* (%)]	Group B [*n* (%)]	Test value	*P* value	Significance
Poor	0	2 (20.0)			
Fair	0	2 (20.0)			
Good	1 (10.0)	4 (40.0)	11.467	0.021	S
Very good	4 (40.0)	2 (20.0)			
Excellent	5 (50.0)	0			

MDT, multidisciplinary team; S, significant.

The overall mean score of our study according to our team and MDT evaluation was 20.5, which falls between excellent and very good for group A. In group B, it was 16.7, which falls between good and very good (Tables 14 and 15).

Discussion

Our study showed that the round block technique has comparable operating parameters and stays at SWLE, with a better cosmetic result and lower re-excision levels.

Patients' demographics such as age, BMI, and presence of medical co-morbidities were similar in both groups that underwent round block or SWLE to diminish the effect of these factors on either operative parameters or cosmetic outcomes.

We took into our consideration that the tumor characteristics of our study cases, such as tumor/breast size ratio and distance from NAC, were nearly the same in both groups in order not to affect our operative parameters, cosmetic outcomes, local recurrence, and re-excision rates.

Through these methods, we made certain that the surgical techniques we used were the only variant, so we could get results that compared between round block technique and SWLE accurately without being affected by any other variant.

The mean age of our study was 47.9 and 49.5 years for groups A and B, respectively. Overall, 70% of the cases fall between 40 and 59 years. This is consistent with the demographic data published by Zeeneldin *et al.* [9], which revealed that the peak of incidence rates for breast cancer in Egypt lies between 55 and 59 years.

Round block with smaller breasts and limited ptosis has been shown to be well fit in women. The circular block circumferential periareolar scar is mostly well hidden, though leaving a longer scar compared with SWLE, making it cosmetically pleasing.

The mean operative time in our study was 111.1 and 107.6 min in radiation of breast therapy (RBT) and SWLE, respectively, which is close to what was published by Akram *et al.* [10], revealing the mean operation time in RBT was 96.5.

Despite a longer suture incision and additional steps of skin de-epithelialization and neo-areolar opening purse string compared with SWLE, the round block technique may have comparable operating time to SWLE. This may be owing to the greater exposure diameter offered by skin de-epithelialization, enabling better access and visualization of the tumor, thus reducing the total operating time reported by Lim *et al.* [6] This could also be attributable in our study to the time waiting for frozen section result; in de-epithelialization step, we benefited from this time.

In the round block population, there was also a lower re-excision rate, which is consistent with the literature that oncoplastic surgery has a lower re-excision rate than SWLE [11].

Other operational parameters such as blood loss intraoperative, first day drain amount, hospital stay lengths, and complications rate were similar in both groups.

Postoperative hematoma occurred in three cases (two from group A and one from group B). It was discovered second day postoperatively and managed conservatively. Patients were prescribed antiedema measures and were already on parenteral antibiotic. Hematoma resolved spontaneously after 3 days.

The patient who had wound infection was diabetic, reflecting the immune-compromised status with diabetes mellitus. Statistically, diabetes mellitus has increased the risk of postoperative wound infection thrice. This is similar to what was published by Urban and Rietjens [12] showing the complication of diabetes mellitus in oncoplastic surgery. The patient received oral antibiotics and instructed to have the wound daily dressed twice until the infection was eradicated. She did not require wound opening for drainage.

None of the previously stated complications resulted in delay of postoperative adjuvant therapy, and all patients were sent to receive their appropriate therapy according to schedule. None of them have had any other problem such as delayed wound healing or compromised final cosmetic outcome.In our study, none of the patients had any malignant recurrence during follow-up visits through 1 year after the surgical removal of the tumor, proving that round block technique is safe from oncological point of view like SWLE.

The donut mammoplasty wound being obscured around the NAC at the transitional zone between NAC and skin played an integral role in improving cosmetic outcome, patient satisfaction, and acceptance in both early post-operative period and late follow-up period. This allowed that the donut mammoplasty has high mean cosmetic outcome score as evaluated by the patients and MDT (68.4 and 20.5, respectively), which approaches the excellent score in contrast with SWLE, which gained less cosmetic scores (45.3 and 16.7, respectively), so RBT has a cosmetic advantage over SWLE. The same results were published by Lim *et al.* [6].

Limitations

Our study is not without limitations. These limitations are summarized as follows:

(1) It is a small prospective study that was done on only 20 patients.
(2) Although round block technique needs special surgical skills and consumes more operation time, in our study, operative time was not significant. This occurred because frozen section pathology result took long time, and we got benefit from this time in the de-epithelialization step.
(3) Some may argue that the altered makeup of the members of the scrub team will affect the operating time due to the variations in the surgeon's operating experience.
(4) Ideally, the exact operating time of the round block procedure should be contrasted directly with the SWLE operating time, without taking into account the axillary procedure. It is not always feasible as a practical matter. There are times when the axillary procedure and breast surgery are concurrently performed, and for breast surgery alone, a clear cutoff time cannot be defined.

Conclusion

In comparison with potential drawbacks associated with other oncoplastic procedures, the round block technique has equivalent operating parameters to SWLE with no evidence of increased surgical complications. In round block, patients were found with lower re-excision rates and better cosmeses as a scarless procedure, without nipple and areola shift, which indicates that the round block technique is superior to SWLE in selected cases

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Conflicts of interest

There are no conflicts of interest.

References

1 Akram M, Iqpal M, Daniyl M, Khan AU. Awareness and current knowledge of breast cancer. Biol Res 2017; 50:22–50.

2 Ibrahim AS, Khaled HM, Mikhail NN, Hoda B, Hossam K. Cancer incidence in Egypt: results of the national population-based cancer registry program. J Cancer Epidemiol 2014; 2014:23–25.

3 Senkus E, kyriakides S, Ohnos S, Penault-Llorca F, Poortmans P, Rutgers E. Primary breast cancer ESMO clinical practice guidelines for diagnosis, treatment and follow up. Ann Oncol 2015; 26:v8–v30.

4 Holmes DR, Schooler W, Smith R. Oncoplastic approaches to breast conservation. Int J Breast Cancer 2012; 2011:16.

5 Rodriguez GJZ, Chavez MD, Valencia GGC, *et al.* Oncoplastic surgery for the conservative treatment of breast cancer in Peru's national institute. Ecancermedicalscience 2018; 12:815.

6 Lim GH, Allen JC, Ng RP. Oncoplastic round block technique has comparable operative parameters as standard wide local excision: a matched case-control study. Gland Surg 2017; 6:343–349.

7 Piper M, Peled AW, Sbitany H. Oncoplastic breast surgery: current strategies. Gland Surg 2015; 4:154–163.

8 Lai HW, Kuo YL, Su C, Chen C, Kuo S, Chen S. Round block technique is a useful oncoplastic procedure for multicentric fibroadenomas. Surgeon 2016; 14:33–37.

9 Zeeneldin AA, Ramadan M, Gaber AA, Taha FM. Clinico-pathological features of breast carcinoma in elderly Egyptian patients: a comparison with the non-elderly using population-based data. J Egypt Natl Canc Inst 2013; 25:5–11.

10 Akram SM, El Kased AF, El Fol HA, Hagag MG. Evaluation of the round block technique in early breast cancer. Egypt J Surg 2018; 37:256–259.

11 Losken A, Dugal CS, Styblo TM, Carlson W. A meta-analysis comparing breast conservation therapy alone to the oncoplastic technique. Ann Plast Surg 2014; 72:145–149.

12 Urban C, Rietjens M, Hurley J. Oncoplastic and reconstructive surgery: qualifications, limits, and mentoring. In: Oncoplastic and Reconstructive Breast Surgery. Milan: Springer; 2013. 441–445. doi: 10.1007/978-88-470-2652-0_48

13 Cano SJ, Klassen AF, Scott AM, Cordeiro PG, *et al.* Information plastic and reconstructive surgery. 2011; 129:293–302. doi: 10.1097/PRS.0b013e31823aec6b