

Cosmetic and Oncological Outcome of Different Oncoplastic Techniques in Female Patients with Early Central Breast Cancer

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Abstract

Breast cancer surgery has progressed greatly over the years, moving away from extreme operations and toward ones with full removal of tumour while keeping the normal parenchyma tissue and so minimising patient morbidity. With this move, patients have seen better aesthetic results and better quality of life without sacrificing oncological safety. Among women with early centrally localised breast cancer, the researchers set out to determine the aesthetic and oncological effects of various oncoplastic procedures. Methods: From August 2020 to November 2021, Benha University Hospital's General Surgery department treated 40 female patients with CLBC using four oncoplastic procedures. Patients were split into four categories based on the kind of surgery they underwent: Grisotti method (n=10) is in Group I. n=10 Melon slicers in Group II. the round block approach (n = 10) is in group III Method used by members of Group IV: Batwing Mastopexy (n=10). Results: NAC-involved and NAC-protected procedures are used to evaluate cosmetic outcomes. There was a statistically significant difference between the Grisotti method and Melon slice approach ($p=0.0225$) for NAC removal procedures in Group I and II (NAC removal operations). Round block mastopexy technique exhibited 8 excellent, one good, and one fair instances, whereas Batwing mastopexy method showed 8 excellent, one good, and one fair cases (7 excellent, 2 good and one fair cases). Reconstruction of the central quadrant following CLBC excision using oncoplastic breast surgery procedures is safe and effective, with acceptable aesthetic results that increase patient satisfaction.

Key words: Cosmetic and Oncological Outcome, Oncoplastic Techniques, Female Patients, Early Central Breast Cancer

1. Introduction

Approximately 18000 women in Egypt were diagnosed with breast cancer in 2014; this represents 32% of all malignancies identified in women in Egypt [1].

For oncological reasons, breast-conserving surgery (BCS) and adjuvant radiation have largely replaced mastectomy in the previous several decades, and have been demonstrated to be equivalent to mastectomy. Aiming to further enhance the aesthetic and functional results of BCS, oncoplastic breast surgery (OBS) was created [3].

Conventional therapy for CLBC was the removal of the whole centre quadrant. The NAC and a portion of the underlying breast parenchyma down to the pectoralis fascia are often removed during this treatment, which may lead to local glandular abnormalities and undesirable aesthetic outcomes including distorted breast contours and scar contracture. Thanks to the development of OPS methods, volume displacement or replacement treatments may be used to address the central glandular defect. OBS was established as an extension of the breastconserving surgery (BCS) in an attempt to enhance the aesthetic and functional outcomes after surgery for breast cancer (BCC) [5].

Different oncoplastic procedures were evaluated in female patients with early central breast cancer in order to evaluate their aesthetic and oncological outcomes.

2. Patients and Methods

Type of the study:

This study was carried out at the Department of General Surgery, Faculty of Medicine, Benha University. A total of 40 female patients with centrally located breast cancer (CLBC) and indicated to oncoplastic breast surgery (OBS) were enrolled into the study.

Target population:

All female patients with centrally located breast cancer who sought treatment at the Department of General Surgery, Faculty of Medicine, Benha University during the study period from August 2020 to November 2021.

Study population:

All female patients who presented to the outpatient clinic with centrally located breast cancer.

Inclusion criteria:

All patients with early central breast cancer were included in the study. The definition of CLBC is cancer located within 2 cm of the areola ⁽⁶⁾.

Exclusion criteria:

- Patients with peripheral or eccentric cancer breast (extends more than 2 cm beyond the areolar margin).
- Multicentric breast cancer.
- History of breast radiotherapy.
- Inflammatory breast cancer (IBC).
- Systemic metastasis.
- Patient refusal of BCS.
- Pregnancy.
- Unfit patients.
- Ethical consideration:

All official permission letters taken from director of the General Surgery Department before start in the data collection. The study purpose and treatment were carefully explained to the patients individually. Then, they were consented to participate in the study. They were allowed to ask questions freely to ensure that they had understood.

Methods:

Every patient was subjected to:

A. Clinical assessment:

Complete history: Personal history [including age (increasing risk of breast cancer with increasing age)

and nullipara or multi para (increasing risk with nullipara)], menstrual history [increasing risk with early menstrual period and late menopause], special habits (as smoking increase the risk), family history (increasing risk of breast cancer, if one member of family of the patient was diagnosed with breast cancer as mother, sister or daughter) and history of drug intake as contraceptive pills or previous radiation exposure

Complete clinical examination of both breasts and axilla including assessment of the breast size (cup size), shape, ptosis (by LaTrenta and Hoffman classification) [7], previous operations (biopsies, previous surgery) in addition to co-morbidities such as diabetes mellitus and obesity.

B. Imaging assessment:

- Ultrasound and mammogram and/ or MRI of breast.
- Metastasis was excluded by metastatic work up in the form of US abdomen, CT chest, and bone scan if needed.

C. Biopsy:

Tru-cut biopsy and immunohistochemistry to determine the biological type of the tumor. Patients with suspected Paget's breast (PDB) disease underwent wedge biopsy.

D. Laboratory investigations:

- Routine laboratory investigations including:
- Complete blood picture.
- Bleeding and coagulation profile.
- Fasting blood sugar.
- Renal function tests (blood urea nitrogen and creatinine)
- Liver function tests (ALT, AST, serum albumin, serum bilirubin).

E. Assessment of the NAC:

Evaluation of NAC is an essential part of the preoperative assessment to detect if NAC is involved or not. NAC complex was excised if any of the following features present: Clinical signs of NAC involvement (retraction of nipple, nipple discharge, ulceration, Paget disease) or radiological findings suggesting malignant involvement of the NAC (distance from the lesion to nipple less than 2 cm, done by MRI).

F. Surgical procedure:

- Grisotti mastopexy.
- Melon slice technique.
- Quadrantectomy with donut technique.
- Quadrantectomy with batwing mastopexy.

Surgical technique:

According to NAC's involvement, size of the breast, and degree of ptosis, we classified the patients into 4 groups (figure 1). Patients who required contralateral breast surgery to achieve bilateral symmetry refused to do any contralateral surgery. Also, patients who underwent NAC resection refused to undergo NAC reconstruction.

Preoperative assessment:

Patients who satisfied our inclusion criteria were screened by a multidisciplinary team that comprised personnel from general surgery, pathology, radiology, radiation, and medical oncology.

Breast size (cup size), breast shape (ptosis), past procedures (biopsy or surgery), and co-morbidities such as diabetes mellitus or obesity were all evaluated on all patients before to surgery, as was a full medical history.

The degree of breast ptosis was assessed using the LaTrenta and Hoffman Classification. In addition to the regular laboratory tests, bilateral mammograms and ultrasonograms, an MRI, and a metastatic work-up, an investigation was carried out. A core needle biopsy was used to confirm the presence of Paget's breast (PDB) disease in patients who had undergone a wedge biopsy.

Surgical methods

Excision of the nipple/areola complex (NAC) down to the pectoralis fascia was required for tumours in the retro-areolar area or bordering on it. The breast specimen was marked with stitches by the physician after surgical removal in order to preserve its orientation. In the operating theatre, frozen slices of breast tissues were examined macroscopically and histologically to evaluate the surgical margins. A one-centimeter safety buffer was always guaranteed.

Sensitive lymph node biopsy (SLNB) was performed on patients who had radiologically verified clinical axilla. Techniques for both intradermal and peritumoral injections were used. With axillary lymph nodes found by SLNB or radiologically, patients were given level I and II dissections. When one or both axillary lymph nodes were found to be positive, an axillary lymph node dissection was performed.

1. Grisotti mastopexy:

It consists of excision of the central quadrant inferior based comma-shaped flap mobilization, with rounded skin island to fill the defect (figures 2 and 3).

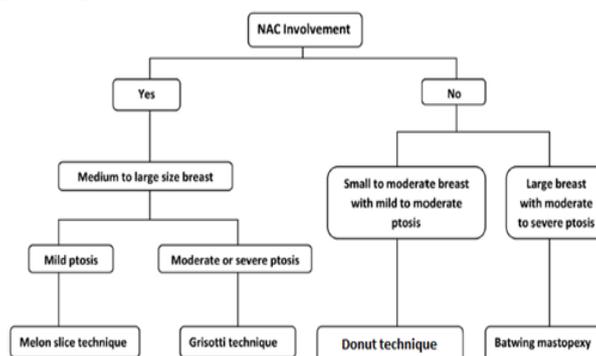


Fig. (1) Outlines of OPS techniques.

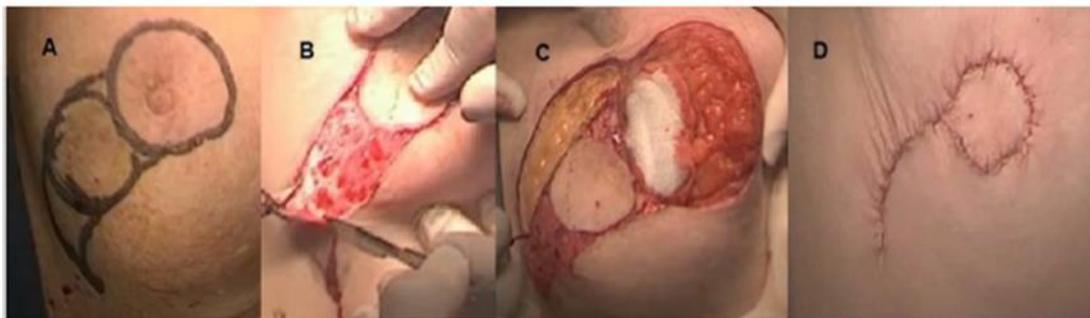


Fig (2): Grissotti technique

- (A) Preoperative mapping.
- (B) Flapde-epithelialization without new areola.
- (C) Central quadrant defect.
- (D) Postoperative view.

Mobilization of the flap will be done using one of the following techniques:

- The medial margin of the flap was incised down to the pectoral fascia with wide mobilization of the flap from the pectoral fascia; then, the flap was advanced and rotated to fill the defect.
- The dermis of the medial and lateral margins of the flap was released to the required extent but keeping its base on the pectoral fascia intact to preserve blood supply.



Fig (3): Another patient with Grisotti technique

2. Melon slice technique:

It consists of horizontal elliptical excision, including NAC, with excision of the tumor with safety margin down to pectoral fascia followed direct closure (figure 4).



Fig (4): Melon slice technique

- (A) Preoperative mapping.
- (B) Elliptical incision.
- (C) Tumor bed.

3. Donut technique:

It consists of 2 circular skin marking, the inner circle is made on the border of the areola, and the outer circle depends on the size and location of the tumor, breast ptosis, and the position of the nipple. De-epithelialization of the tissue between 2 incisions, then excision of the tumor with safety margins down to the pectoral fascia. Skin incisions are closed using a running technique (figure 5).



Fig. (5) Donut technique.

- (A) Preoperative mapping.
- (B) De-epithelialization between 2 circles.
- (C) Central quadrantectomy defect.
- (D) Postoperative view.

4. Batwing mastopexy technique:

Two semicircular incisions are performed with angled “wings” on each side of the NAC. The 2 half-circles are positioned to allow them to be re-approximated to each other at wound closure. Removal of these skin wings enables the semicircles to be shifted together without creating redundant skin folds at closure (figure 6).

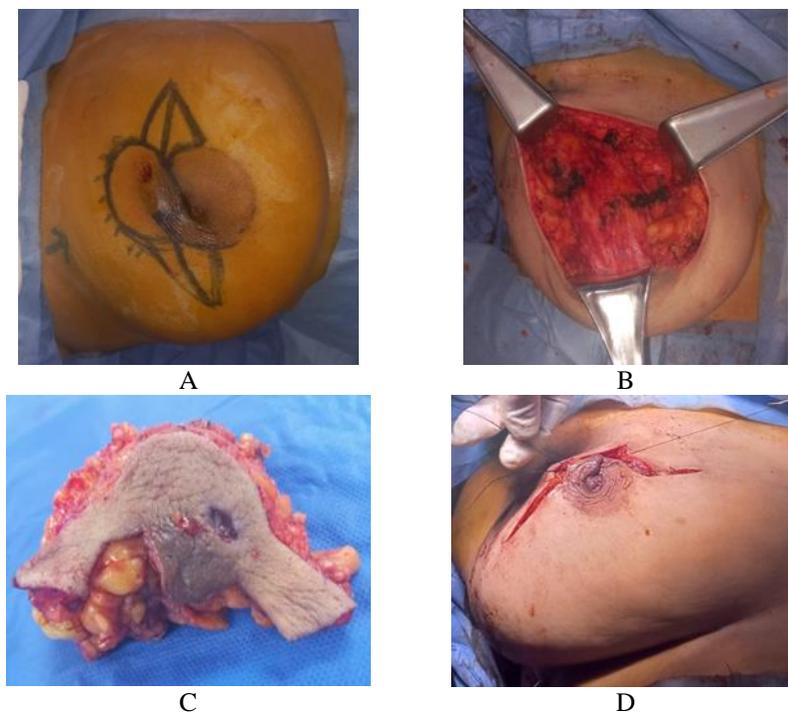


Fig. (6) Batwing mastopexy technique.

- (A) Preoperative mapping.
- (B) Glandular defect.
- (C) Specimen.
- (D) Immediate postoperative view.

3. Results:

As Grisotti technique and Melon slice technique are indicated in patients' tumors with NAC extent, all patients in Group I and II was with NAC involvement before surgery. In contrast, patients in group III and IV was with no NAC involvement before surgery. ($p < 0.0001$). The patients' NAC involvement before surgery in each group are showed in details in Table (1)

Table (1) NAC involvement before surgery distribution in all studied groups.

NAC involvement before surgery	Yes	No	X ² test	P value
Group I				
Grisotti technique (n=10)	10 (100%)	0 (0%)		
Group II				
Melon slice technique (n=10)	10 (100%)	0 (0%)		
Group III			40	<0.0001
Round block technique (n=10)	0 (0%)	10 (100%)		
Group IV				
Batwing mastopexy technique (n=10)	0 (0%)	10 (100%)		

After surgery, NAC was involved in 8(80%) of patients in Group I (Grisotti technique) and 6(60%) in group II (Melon slice technique) while NAC completely removed in Group III (Round block technique) and group IV (Batwing mastopexy technique) There was a statistically significant difference between groups according to Menopausal status. ($P < 0.0001$). The patients' NAC involvement before surgery in each group are showed in details in Table (2)

Table (2) NAC involvement after surgery distribution in all studied groups

NAC involvement after surgery	Yes	No	X ² test	P value
Group I				
Grisotti technique (n=10)	8 (80%)	2 (20%)		
Group II				
Melon slice technique (n=10)	6 (60%)	4 (40%)		
Group III			22.418	<0.0001
Round block technique (n=10)	0 (0%)	10 (100%)		
Group IV				
Batwing mastopexy technique (n=10)	0 (0%)	10 (100%)		

There were 14 patients (35%) who developed postoperative complications. 6 patients (15%) developed superficial wound infection and were managed conservatively with antibiotics. 4 patients (10%) developed hematoma, all were treated conservatively. 4 patients (10%) developed seroma all were treated with needle aspiration. There was no statistically significant difference between groups according to postoperative complications. Postoperative complications are illustrated in Table (3)

Table (3) Complications distribution in all studied groups.

Complications, n (%)	Seroma	Hematoma	Wound infection	Total	Fisher	P value
Group I				4 (40%)		
Grisotti technique (n=10)	0 (0%)	2 (20%)	2 (20%)			
Group II				3 (30%)	0.439	0.931
Melon slice technique (n=10)	1 (10%)	1 (10%)	1 (10%)			

Round block technique (n=10)	1 (10%)	1 (10%)	2 (20%)	4 (40%)
Batwing mastopexy technique (n=10)	2 (20%)	0 (0%)	1 (10%)	3 (30%)
Total	4 (10%)	4 (10%)	6 (15%)	14 (35%)

The tumor size (mean, 2.48 ± 0.90 cm). Surgical safety margins were negative in all patients with a mean 1.08 ± 0.57cm. There was no statistically significant difference between groups according to Tumor size and Safety margins

Tumors were staged as pT1 in 11 patients (27.5%) and pT2 in 29 patients (72.5%). 26(65%) patients presenting with positive axillary lymph nodes. There was no statistically significant difference between groups according to TNM stage and +ve LN involvement

All Pathological properties distribution are illustrated in Table (4) and types are illustrated in table (4)

Table (4) Pathological properties distribution in all studied groups.

Pathological properties	Group I Grisotti technique	Group II Melon slice technique	Group III Round block technique	Group IV Batwing mastopexy technique	Total	ANOVA / x2	P value
Tumor size,cm	2.6±0.87	2.2±1.03	2.4±0.79	2.7±0.92	2.48 ±0.90	0.5271	0.667
Safety margins	1.1±0.63	0.9±0.71	1±0.48	1.3±0.47	1.08 ±0.57	0.8627	0.470
TNM stage							
pT1	3 (30%)	4 (40%)	2 (20%)	2 (20%)	11 (27.5%)	1.379	0.710
pT2	7 (70%)	6 (60%)	8 (80%)	8 (80%)	29 (72.5%)		
+ve LN involvement	6 (60%)	7 (70%)	5 (50%)	8 (80%)	26 (65%)	2.197	0.532

Cosmetic results are assessed by dividing techniques to NAC involvement operations and NAC preserved operations. Group I and II (NAC removal operations) showed a statistically significant difference between Grisotti technique which shows better results (7 excellent cases, 2 good and 1 fair) and Melon slice technique which shows (only one excellent cases , 5 good and 4 fair) (p=0.0225)

Group III and IV (NAC preserved operations) showed no statistically significant difference as Round block technique shows (8 excellent, one good and one fair cases) while Batwing mastopexy technique shows (7 excellent, 2 good and one fair cases) table (5)

Table (5) cosmetic result distribution in all studied groups.

cosmetic result, n (%)	Excellent	Good	Fair	X ² test	P value
NAC involvement operations					
Group I Grisotti technique (n=10)	7 (70%)	2 (20%)	1 (10%)	7.585	.0225
Group II Melon slice technique (n=10)	1 (10%)	5 (50%)	4 (40%)		
NAC preserved operations					
Group III Round block technique (n=10)	8 (80%)	1 (10%)	1 (10%)	0.40	0.8187
Group IV Batwing mastopexy technique (n=10)	7 (70%)	2 (20%)	1 (10%)		
Total	25 (62.5%)	9 (22.5%)	6 (15%)	12.805	0.04624

4. Discussion

Tumors involving the NAC are candidates for the Grisotti and Melon slice techniques, hence all patients in Groups I and II had NAC involvement at the time of operation. Patients in groups III and IV had no NAC involvement before to surgery. ($p < 0.0001$).

Patients in Group I (Grisotti technique) and 6 (60 percent) in Group II (Melon slice technique) had NAC partially or completely removed during surgery, whereas in Group III (Round block technique) and Group IV, NAC remained in 8 (80 percent) of patients and 6 (60 percent) of patients, respectively, after surgery (Batwing mastopexy technique) According to their Menopausal state, there was a statistically significant difference between the groups. ($P < 0.0001$).

Postoperative problems occurred in 14 individuals (35%). Patients with superficial wound infections were treated with antibiotics in six cases (15 percent). Four patients (10 percent) had hematomas, but they were all handled conservatively. Only four individuals (10 percent) were found to have seroma, and all of them were successfully treated by needle aspiration. Complications after surgery were not significantly different between groups.

The tumor's average diameter (2.4 0.90 cm). All patients had negative surgical safety margins, with a mean of 1.08 0.57cm. Tumor size and safety margins had no statistically significant impact on the results.

pT1 tumours were found in 11 individuals (27.5 percent of the total) while pT2 tumours were found in 29 patients (the remainder) (72.5 percent). Axillary lymph nodes were found to be positive in 26 of the patients, or 65 percent of the total. Based on TNM stage and positive lymph node involvement, there was no statistically significant difference between groups.

The results of NAC involvement procedures and NAC preserved operations are divided into two categories for the sake of evaluating cosmetic outcomes. There was a statistically significant difference between the Grisotti approach (7 excellent cases, 2 good cases, and 1 fair case) and the Melon slice technique (just one excellent case, 5 good cases, and 4 fair cases) in Group I and II (NAC removal surgeries).

Round block mastopexy technique exhibited 8 excellent, one good, and one fair instances, whereas Batwing mastopexy method showed 8 excellent, one good, and one fair cases (7 excellent, 2 good and one fair cases)

Oncoplastic breast surgery has also been shown to have excellent patient satisfaction, according to a few studies [7, 8, 10].

Another study, by Chan et al. [11] found that 94% of patients were either very or somewhat happy with the aesthetic outcome; 86% of patients believed the treated breast was almost same or just slightly different from the untreated breast.

Between 84% and 89% of patients had a positive aesthetic result, according to Haloua et al. [12]. The majority of patients (84 percent) in Meretoja et al. [13], who used oncoplastic methods, had negative margins and

satisfactory aesthetic outcomes. One study found that 96% of patients were somewhat to highly satisfied with the surgery performed by Adimulam et al.

According to Dal et al. [15], the control breast was more ptotic and greater in size than the treated breast in a significant number of patients, while the treated breast was smaller and more symmetrical. Breast surgery was completed to 96.7 percent satisfaction, whereas (3.3 percent) prefer subcutaneous mastectomy with implant Eighty-three percent of patients refused to have their treated breasts reshaped; six percent of patients opted for nipple reconstruction.

5. Conclusion

Using oncoplastic breast surgery to rebuild the centre quadrant after CLBC excision is safe and effective, and improves patient satisfaction.

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