A prospective study for superior medial technique as an oncoplastic procedure for lower and outer quadrant breast cancer: oncological safety and clinical outcomes

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Background
Breast cancer is the most common site of cancer in women in Egypt as it accounts for ~38.8% of total malignancies among Egyptian women; it is an important cause of mortality among women. For many women with early-stage breast cancer, a combination of partial mastectomy and radiation therapy – together referred to as breast-conserving therapy – is preferable to total mastectomy.
Objective
To focus on superior medial technique as an oncoplastic procedure for the management of breast cancer and to assess the technique clinically regarding oncological safety, surgical outcomes, and patient satisfaction.
Patients and methods
It was a prospective, analytical study that included 20 patients aiming to assess clinically the superior medial oncoplastic technique for lower and outer quadrant breast cancer regarding oncological safety and patient satisfaction. This study was conducted at Bahya Specialized Breast Cancer Hospital and Ain Shams University Hospitals.
Results
All the 20 patients underwent oncoplastic breast surgery which implied two major technical steps, excision of the tumor with a wide safety margin through a predesigned incision with frozen section examination for margins along with formal axillary dissection, followed by immediate reconstruction using superior medial technique. Breast cancer, like other cancers, occurs because of an interaction between an environmental (external) factor and a genetically susceptible host. Normal cells divide as many times as needed and stop. They attach to other cells and stay in place in tissues. Cells become cancerous when they lose their ability to stop dividing, to attach to other cells, to stay where they belong, and to die at the proper time.
Conclusion
This approach has enabled us to increase the number and extend the indications of breast-conserving surgery with wider margins offering safer oncologic control with more satisfactory cosmetic outcome.

Keywords:
breast conserving surgery, breast cup size, Oncoplastic breast surgery, Superior medial pedicle technique

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Introduction

The breast is the true mirror of femininity, and it remains in the mind of every one of us as the heart of womanhood, with its role as nourisher and comforter. These roles evoke the idea of the importance and the affection of this delicate organ has in the minds of women [1].

Breast cancer, according to the National Cancer Institute, is the most common site of cancer in women in Egypt as it accounts for ~38.8% of total malignancies among Egyptian women; it is an important cause of mortality among women [2].

Breast reconstruction is becoming increasingly important due to changes in patient expectations and demand. There is growing recognition that immediate reconstruction in appropriately selected women can combine an oncological and esthetic procedure in one operation with excellent results. Since most breast surgery is performed by general surgeons, most reconstructions were performed as delayed procedures by plastic surgeons. Increasingly, breast surgery is being performed by breast surgeons trained in oncoplastic techniques who can offer immediate reconstruction with therapeutic and economic options [3].

Surgical management of malignant diseases represents an exemplary model of multidisciplinary management. The combined modality approach to the treatment of breast cancer patients that includes primary surgical treatment, radiation therapy, and chemotherapy needs careful integration of these modalities with the new methods of reconstructive breast cancer surgery [1].

For better outcomes and minimal low complications, it is necessary to consider the basic aspects of this technique. First, the incision design depends on the presence or absence of previous scars, breast volume, and ptosis [4].

With good consideration of risk factors for recurrence biologically and anatomically, superior medial technique is a good option for selected node-positive breast cancer patients [5].

The lower pole of the breast was the first recognized high-risk location for deformity. Retraction of the skin and downward deviation of the nipple–areola complex (NAC) resulting from excision of tissue from the 6 o'clock position became known as the 'bird's beak' deformity. A superior pedicle mammoplasty can allow for large-volume excision at the lower pole without causing the NAC deviation with the added benefit of breast reshaping [6].

Oncoplastic surgery with the superior pedicle breast reduction technique is useful for the treatment of tumor of the inferior quadrant of the breast from the 3 o'clock to the 9 o'clock position. Obtaining clear margins (the larger, the better) is an essential step in the procedure in order to reduce cancer recurrence rate. The recurrence rates are influenced by the tumor size, the tumor type, vascular invasion, multicentric disease, and the age of the patient [7].

The inferior pedicle technique can reliably preserve the NAC region well perfused in a breast of almost any size and shape. It is a technique that is easy to learn. Although it requires some flap undermining and the Wise pattern in most cases, it can be performed in 2–3 h. Some feel that the inferior pedicle technique has a lower complication rate since the inferior location obliterates dead space in the dependent region of the breast [8].

The round block technique can be used in patients with small-sized and moderate-sized breasts without ptosis and for tumors located near the NAC but without nipple invasion. In this technique, care must be taken to prevent injury to the dermis to preserve the blood supply of the NAC. After the surgery, the cosmetic results are satisfactory because there are only perimammary scars without any additional scars, and in the case of a large NAC, a smaller neo-areola may be created [9].

Although shown to be a good alternative to mastectomy for the appropriately selected breast cancer patients, traditional lumpectomy may result in poor cosmoses. Central oncoplastic techniques, including central lumpectomy, donut mastopexy lumpectomy, and variations in reduction mastopexy lumpectomy have been developed to address this problem. By combining large-volume tumor removal with breast-flap advancements, the oncoplastic techniques allow wider margins of resection and better breast shape and contour preservation [1].

Aim of the study

The aim of this study was to focus on superior medial technique as an oncoplastic procedure for the management of breast cancer and to assess the technique clinically regarding oncological safety, surgical outcomes, and patient satisfaction.

Patients and methods

Type of the study

It was a prospective, analytical study that included 20 patients aiming to assess clinically the superior medial oncoplastic technique for lower and outer quadrant breast cancer regarding oncological safety and patient satisfaction.

Study settings

This study was conducted at Ain Shams University Hospitals and at Bahya Specialized Breast cancer Center. Approval of the ethics committee and written informed consent from all participants were obtained. Superior medial technique was proposed for patients in whom breast conservative treatment is possible on oncologic grounds, but where a standard resection without reconstruction would lead to a poor cosmetic outcome. Diagnosis and staging examinations were carried out according to the standard protocol being conducted at Ain Shams University Hospitals In-patient postoperative recovery time ranged from 24 h to a maximum of 2 days. All patients were discharged with a set of instructions and follow-up schedule. Our patients were all followed up for both oncologic and cosmetic grading and were referred to receive suitable adjuvant chemotherapy and/or radiotherapy according to the final pathology

reported after conventional pathological evaluation. Patient selection was achieved through a number of inclusion and exclusion criteria.

Inclusion criteria

Female patients with unilateral invasive breast cancer, of more than 18 years, T1–T2 node-positive patients, and T3 patients with a large breast volume.

Exclusion criteria

Distant metastasis, history of previously treated ipsilateral breast cancer, inflammatory tumors, T4 breast cancer, age less than 18 years, lesions of less than 1.5 cm from the nipple, lesions at superior medial quadrant, diffuse microcalcification, patients demanding mastectomy for fear of local recurrence, patients not convinced with the proposed procedure after adequate explanation, and patients refusing postoperative adjuvant radiotherapy, and patients with absolute contraindication to breast-conserving surgery were carefully excluded from the study. Those showing widespread microcalcifications or multicentric breast cancer in more than one quadrant of the breast on mammography were candidates for conventional modified radical mastectomy; frozen section examination was done for each specimen to exclude a positive margin and determine the presence of intraductal component. Patients with previously irradiated breast or having an absolute contraindication for adjuvant radiotherapy were excluded by their history.

All patients were submitted 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, complete clinical examination in the outpatient clinic.

Preoperative investigations were performed that included laboratory tests: including complete blood count, liver profile, kidney profile, coagulation profile, blood sugar. Radiological examination: including bilateral digital mammography in at least two views (craniocaudal and mediolateral oblique). Computed tomography (CT) chest, CT pelvic-abdomen with contrast as part of our metastatic workup protocol, bone scan as indicated and upon the patients' complaint from bone ache. ECG and echocardiography were performed on request by the anesthiologist when indicated. Tissue biopsy using Tru-cut needle core biopsy in all patients was indicated.

Multidisciplinary team

Multidisciplinary team (MDT) at the breast unit at the General Surgery Department of Ain Shams University reviewed every single case independently. The MDT included: breast surgery consultant, pathology consultant, plastic surgery consultant, and radiology consultant. Discussion was made up on every case including her history, examination, and investigations, until the decision is 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 was explained using pictures of similar cases to help visualization of the outcome, risks, and benefits of the suggested procedure along with its possible intraoperative and postoperative possible complications were also clearly stated and explained individually for each procedure, which included wound infection, fat necrosis, failure of flap, NAC sloughing, asymmetry or failure of adequate cosmetic outcome and incidence of local recurrence and also, the change of the strategy of the postoperative oncological management and the need for postoperative radiation dose to the remaining tissue of the breast and the resultant effect of this dose on the skin and cosmetic outcome. All patients were evaluated by our surgical team prior to surgery; full photography of the breast were taken from multiple views.

The breast volume excised plays an important role for breast cosmesis after breast-conserving treatment. In patients with an expected volume reduction of more than 10%, surgeons should think about the use of oncoplastic surgery as a cosmetic outcome may significantly be impaired. A breast volume reduction of more than 10% reduced the cosmetic result by 50%. This is especially true for multifocal lesions where resection volumes may be 25% of the breast or larger, as one quadrant has at least to be respected. Patients with microcalcifications and suspected intraductal carcinoma (ductal carcinoma in situ) are also good candidates for oncoplastic surgery as ductal carcinoma in situ is often multifocal. Cosmetic results after breast-conserving surgery of breast cancer in the medial, central, or lower quadrant yields worse results compared with other locations.

Concerning central nipple involvement, it is clear that central lumpectomy without any reconstruction of the NAC will reduce the cosmetic outcome. In the lower quadrant, the defect is easily visible compared with the other side. However, in the upper lateral quadrant, the gravity of the breast parenchyma may stretch the skin

over the defect and may improve cosmesis without using a local oncoplastic technique [3].

The ideal breast size varies the most with differing personal and social preferences. It is important to balance a woman's breast size with the rest of her figure. Breast size was estimated by cup size which represents the difference between two measures: the first is chest circumference just below the breast at the inframammary fold and the second one is the bust circumference representing the circumference at the most projecting part of the breasts usually at the level of the nipples. The following table represents breast cup size chart.

The breast cub size was estimated for every single case and a score was given for each cup size as the following (Table 1).

A formal consent was written and explained to the patient. The consent was signed 1 day prior to 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 he. Also, the reason of the photography was discussed, explained, and consented. Medical photographs were taken and kept in the patient's records as agreed upon. At least two views were taken: front and side views. Pictures were taken to the patients along their follow-up visits to keep record and document progress.

Preoperative marking

Mark up and design of planned incision were done on the morning of the surgery in the holding area of the operating theater in the presence of a breast care nurse and the surgical team. Measurements were taken and kept with the patient standing in an upright position before receiving preanesthetic drugs. Drawings were made using waterproof skin markers (Fig. 1).

Table 1 Breast cup size score given for the cases in the study

Breast cup size	Given score
Breast cup size A	1
Breast cup size B	2
Breast cup size C	3
Breast cup size E	4
Breast cup size D	5
Breast cup size F	6
Breast cup size G	7

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

Operating room setup and surgical equipment

Surgery was performed in the operating rooms of the Ain Shams University Hospitals and Bahya Cancer Specialized Hospital (Figs 2–4).

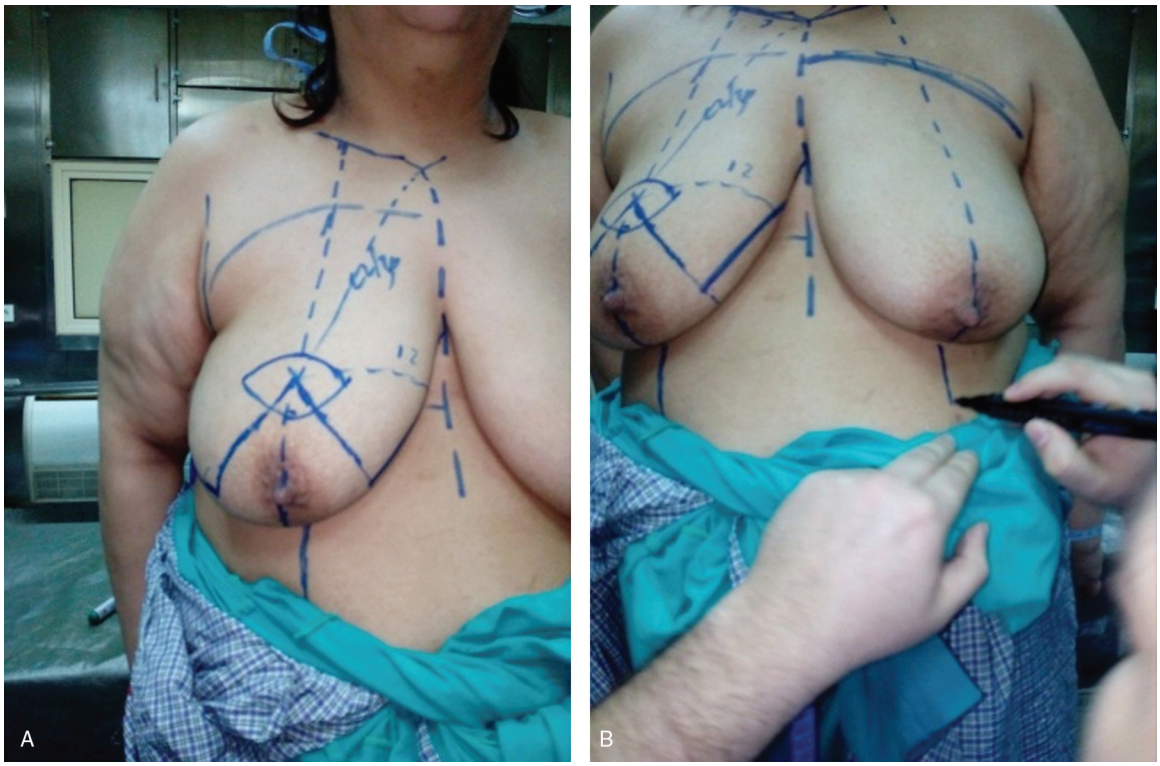
This technique is based on superior areolar vascular pedicles such as those proposed. This may be useful in cases of tumors situated in the lower quadrants and are appropriate for large breasts or medium-volume breasts with minimal ptosis. The decision on whether to perform only a vertical scar or an inverted 'T' scar will depend on the level of hypertrophy and the level of ptosis. For small breasts and those with less ptosis, it is possible to perform only a vertical scar, and for large breasts with major ptosis an inverted 'T' scar will avoid the cutaneous excess such as the skin fold produced in the vertical scar. The position of the scar as vertical or an inverted 'T' can be central (more frequent), medial, or lateral, according to the location of the tumor and the need for skin removal on the nodule aiming to obtain better surgical radicalization [1]. The patient is advised about the possible complications: the risk of immediate or later mastectomy when the margins are positive and if not enough breast is left in place for a cosmetic reconstruction [1].

This pattern is indicated to prevent deformities in the lower pole, especially in voluminous breasts, and reduce the toxicity caused by radiotherapy in ptotic breasts. It is, therefore, indicated in medium- or big-sized breast (with resections of 200–1000 g) with moderate or severe ptosis. From an oncological point of view, it is indicated in tumors located in the lower pole that can be multicentric, since a large amount of tissue will be excised. It can be also indicated in tumors located in the upper pole (or the intersection of upper quadrants close to the NAC) by using a pedicle of the lower pole [13].

Surgical technique

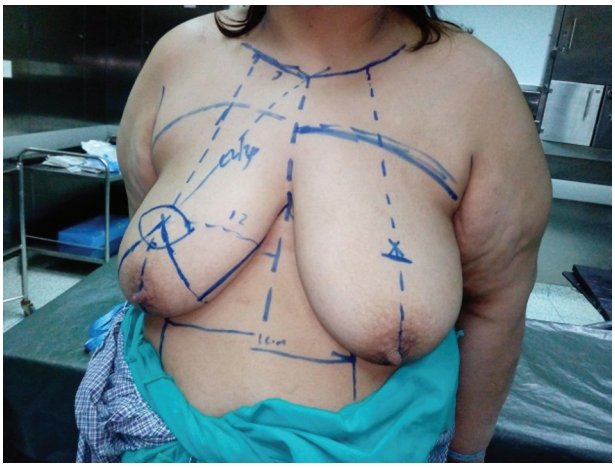
The patient is placed in the supine position with the arms abducted for axillary access, with the possibility to

Figure 1



Preoperative drawing while the patient standing.

Figure 2



Picture after completion of preoperative drawing.

seat the patient on the operative table to control the symmetry (Fig. 4).

Incision

A reduction mammoplasty keyhole pattern incision is made, and the skin above the areola is de-epithelialized in preparation for skin closure. The Wise pattern is the most commonly used incision for reduction mammaplasties, which offers the surgeon wide access to the breast parenchyma and allows skin excision in both vertical and horizontal dimensions and can be used with any pedicle.

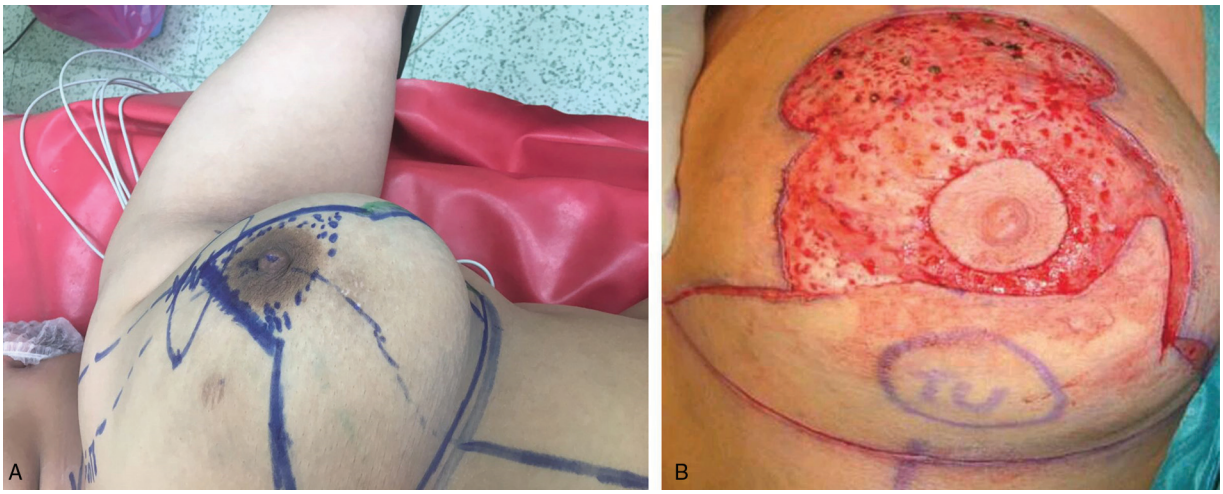
Dissection

A superior pedicle flap is created by inframammary incision and undermining of the breast tissue off the pectoral fascia to mobilize the NAC and the underlying tissues. Mobilization of the breast tissue allows palpation of both the deep and superficial surfaces of the tumor, which can aid the surgeon in determining the lateral margins of excision around the target lesion. For cancers located in the inferolateral or inferomedial quadrants, the keyhole pattern can be rotated slightly to allow for a more lateral or medial excision, while at the same time, the NAC is moved in a direction opposite to that of the surgical defect. Commencing inferiorly and proceeding superiorly beneath the tumor, full-thickness excision of the lesion is completed, with at least a 1 cm macroscopic margin of normal tissue and the skin overlying the lesion being removed (Fig. 5).

Closure

Recentralization of the NAC is performed to recreate a harmonious breast size and shape. The medial and lateral breast flaps are undermined and sutured together to fill the excision defect, leaving a typical inverted-T scar. Uplifting of the NAC by virtue of

Figure 3



(a) Preoperative drawing while the patient is lying down on the table and (b) deepithilization in the superior pedicle flap.

Figure 4

Preoperative drawing while the patient is lying down on the table.

removal of the skin island superior to it helps restore a youthful appearance to the breast but can create mild asymmetry in comparison with the contralateral breast. For patients with macromastia, consistent positioning of the breast for radiotherapy may be difficult, resulting in dosing inhomogeneity and suboptimal treatment. These patients can benefit from reduction mastopexy lumpectomy using a unilateral or bilateral approach (Fig. 6).

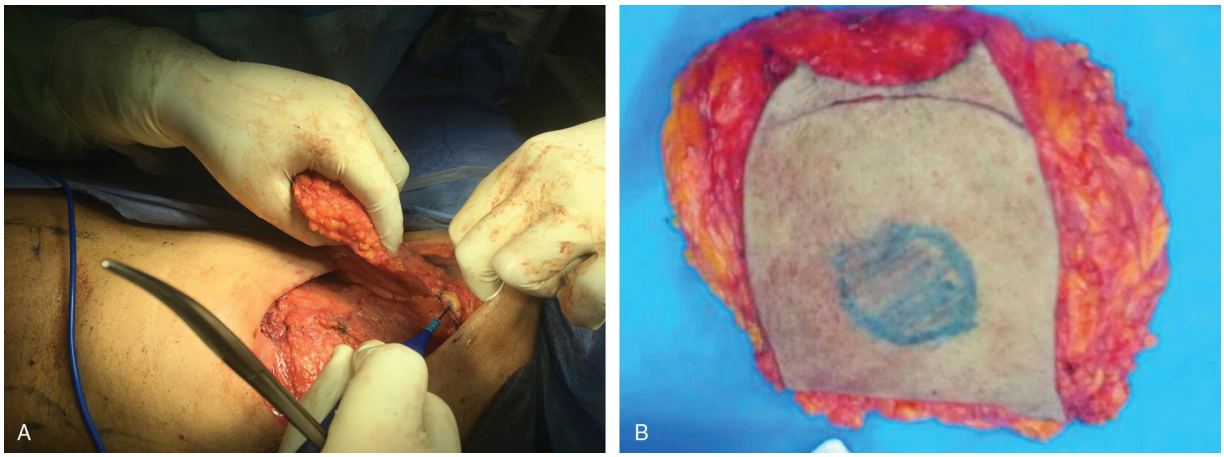
Postoperative management

Prophylactic broad-spectrum antibiotic which was third-generation cephalosporin 1 g was administrated to all patients upon induction and during the whole period of hospital stay. Postoperative pain and discomfort were encountered and the patients were given routine postoperative analgesia in the form of pethidine 50 mg after recovery from anesthesia followed by a fixed dose of NSAIDs every 8 h in the first 24 h and when needed after that. The patients were discharged at the second day postoperatively if everything is fine. They were discharged on antibiotics, analgesics, and anti-edema agents. They were advised to wear a well-fitting sport bra following all reconstruction procedures. Drains were removed in follow-up visits when the daily volume is less than 40–50 ml. The patients were instructed to undergo arm and shoulder mobilization and a set of exercises to avoid stiffness of the shoulder joint and decrease arm edema after axillary surgery. Dressing once daily with betadine was done for all patients.

Follow-up

The patients were given a follow-up schedule upon discharge from the hospital at the following first week every 3 days for dressing and monitoring the drains and then the following 2 weeks every 4 days until removal of the drains and stitches. After the final pathology report is available, the patients were referred to the oncology department to start their adjuvant therapy according to our standard protocol that ranged from 3 to 8 weeks. All patients were given the contact information of the surgeon in case any complication arises and were asked to pass by the clinic at least once a month during the course of their adjuvant therapy. After completion of the adjuvant therapy postoperative radiotherapy and its effect such as redness, ecchymosis, and skin dark pigmentation with some edema, the patients were asked to follow up in the surgical department clinic once every 3 months for 6 months for clinical examination, breast ultrasound and tumor markers, bilateral mammography, and routine investigations as required (Fig. 7).

Figure 5



(a) Intraoperative dissection and (b) specimen.

Figure 6

(a, b) Postoperative wound closure and (c) primary closure superior pedicle technique.

Assessment of the cosmetic outcome

Cosmetic outcome was evaluated during the early postoperative period and on follow-up. Evaluation was done by means of a scoring system, graded from one to five, one indicating poor results and five indicating excellent results. The cosmetic outcome was evaluated by the surgeon, the patient, and the breast MDT by postoperative photographs, then after 2 weeks and at 1 month. Pictures were taken before and after surgery for comparison in terms of breast contour, breast size and shape, degree of ptosis, NAC deviation, and degree of

Figure 7

Follow-up scar (postoperative) after 2 weeks.

asymmetry. Comparison of preoperative and postoperative breast measurements were taken in terms of NAC position to the mid-humeral level, distance from the sternal border, and inframammary sulcus. Reevaluation was done after completion of adjuvant chemoradiotherapy and radiotherapy during the 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.

Statistical analysis

Data will be collected, revised, coded, and entered into the Statistical Package for the Social Sciences (IBM SPSS), version 24, and the following will be done: qualitative data will be presented as number and percentages while quantitative data will be presented as mean, SDs, and ranges.

Results

The age of the patients varied from 26 and 60 years. The mean age for our study was 45.7 (Table 2).

On preoperative patient preparation, full history taking and full laboratories are done; five patients among the 20 patients were found to have medical comorbidities; three patients have diabetes mellitus; one patient was found to have hypertension and one patient to have ischemic heart disease (Table 3).

The tumor size was evaluated by ultrasound 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 smallest tumor size was 1 cm, the largest one was 3.2 cm, and the mean tumor size was 2 cm (Tables 4 and 5).

Table 2 Mean age of the study

	Mean±SD	Minimum	Maximum
Age	45.70±9.27	26	60

Table 3 Number and percent of complications

Comorbidity [*n* (%)]	
No	20 (75)
Yes	5 (25)
Type of comorbidity [*n* (%)]	
None	20 (75)
DM	3 (15)
HTN	1 (5)
IHD	1 (5)

DM, diabetes mellitus; HTN, hypertension; IHD, ischemic heart disease.

Table 4 Mean tumor size in the study

	Mean±SD	Minimum	Maximum
U/S size	2.00±0.47	1.00	3.2

Table 5 Mean breast cup size for the study

	Mean±SD	Minimum	Maximum
Mean breasts size	3.33±1.56	1.00	7.00

The distance from the NAC was variable among the cases of the study; the nearest tumor was 1.5 cm from NAC, the farthest was 4.6 cm from NAC with a mean distance of 2.84 cm (Tables 6 and 7).

Our mean operation time was 107 min (1 h and 45 min) (Table 8), the fastest procedure finished in 90 min, the longest took 155 min.

All 20 patients have had a drain left inside the wound with two separate limbs, one in the breast wound exiting from the lateral side of Inframammary fold (IMF) and the other in the axilla. The amount of blood lost in the first 24 h was estimated by the amount of blood in the drain in the first day postoperatively. The mean amount of blood collected in the drain in the first day was 83.83 ml. The maximum amount in the drain was 125 ml while the minimum amount was 50 ml (Table 9).

Postoperative hospital stay

All patients were admitted to the hospital one day before surgery for preoperative anesthesia consultation and to fulfill all their laboratory workup, and were then discharged one to two days postoperatively once they are able to move and proceed to normal daily activities.

Any of the patient who complains of postoperative pain or delay in movement are allowed to stay until they are

Table 6 Mean distance of the tumor from nipple–areola complex among the patient population

	Mean±SD	Minimum	Maximum
Distance from NAC	2.84±0.93	1.5	4.6

NAC, nipple–areola complex.

Table 7 Location of the tumor among the patient population

Tumor location	Number of patient [*n* (%)]
Lower outer quadrant	10 (50)
Tumor at upper outer quadrant	8 (40)
Lower inner quadrant	2 (10)

Table 8 Mean operation time for our study

	Mean±SD	Minimum	Maximum
Operative time	107.60±14.50	90.00	155.00

Table 9 Mean first day postoperative drain amount for the study

	Mean±SD	Minimum	Maximum
1st day drain	83.83±22.12	50.00	125.00

able to leave. Most of the patients were discharged in the morning of the second day postoperatively (i.e. 24 h postoperatively).

The mean postoperative stay period is 30 h (Table 10); however, the longest postoperative stay period was 3 days.

During the follow-up period complications occurred only in five cases, in the form of: three cases of infection and two cases of ulcer formation (Table 11).

Postoperative results provided by our pathologist showed that 17 of our patients had invasive ductal carcinoma, two of our patients had invasive lobular carcinoma, and one of them had mucinous carcinoma (Table 12).

Cosmetic outcome was estimated using a scoring system which was made up from the three independent grading parties (surgeon, patient, and MDT of the breast) based on the level of satisfaction to give an overall score for the cosmetic outcome.

The cosmetic outcome score was based on multiple items that made up a check list to be evaluated by our team and the MDT of the breast for every single case, this is the check list: the overall shape of the breast, the symmetry of both breasts, the site and direction of the nipple, the volume of the breast, and the skin incision shape

Table 10 Mean postoperative stay for our study

	Mean±SD	Minimum	Maximum
Postoperative stay	30.00±8.77	24.00	72.00

Table 11 Number and percent of complications among the patient population

Complications	*n* (%)
Ulcer	
Negative	18 (90.0)
Positive	2 (10.0)
Infection	
Negative	17 (85.0)
Positive	3 (15.0)

Table 12 Postoperative pathological type of tumor among the patient population

Postoperative pathological type of tumor	*n* (%)
IDC	17 (85)
ILC	2 (10)
Mucinous carcinoma	1 (5)

IDC, invasive ductal carcinoma; ILC, invasive lobular carcinoma.

These elements were discussed for every single case and analyzed to give a scoring system graded from 1 to 5 as the following (Table 13).

The overall mean score of our study was 4.23 which falls between very good and excellent (Table 14).

The following is the number of cases for each grade of the scoring system for the whole study (Table 15).

Discussion

Breast cancer is cancer that develops from the breast tissue. Signs of breast cancer may include a lump in the breast, a change in breast shape, dimpling of the skin, fluid coming from the nipple, or a red scaly patch of skin. In those with distant spread of the disease, there may be bone pain, swollen lymph nodes, shortness of breath, or yellow skin [10].

Outcomes for breast cancer vary depending on the cancer type, extent of disease, and person's age. Survival rates in the developed world are high, with between 80 and 90% of those in England and the United States alive for at least 5 years. In developing countries survival rates are poorer. Worldwide, breast cancer is the leading type of cancer in women, accounting for 25% of all cases. In 2012, it resulted in 1.68 million new cases and 522 000 deaths. It is more common in developed countries and is more than 100 times more common in women than in men [10].

Table 13 Postoperative cosmetic scoring system

5	Excellent
4	Very good
3	Good
2	Fair
1	Poor
0	Ugly

Table 14 Mean cosmetic outcome for our study

	Mean±SD	Minimum	Maximum
Cosmetic outcome	4.23±0.86	2.00	5.00

Table 15 Number of cases for every score of cosmetic outcome

Cosmetic outcome	*n* (%)
Score 5	14 (70)
Score 4	4 (20)
Score 3	1 (5)
Score 2	1 (5)
Score 1	0 (0)
Score 0	0 (0)

Breast cancer, like other cancers, occurs because of an interaction between an environmental (external) factor and a genetically susceptible host. Normal cells divide as many times as needed and stop. They attach to other cells and stay in place in tissues. Cells become cancerous when they lose their ability to stop dividing, to attach to other cells, to stay where they belong, and to die at the proper time.

Oncoplastic breast surgery is based on three basic principles: ideal breast cancer surgery with wider excisions, immediate breast reconstruction, and immediate symmetry of the other breast whenever necessary. This is achieved through several techniques based on tumor location, characteristics of the breast, volume of mammary resection, and clinical evaluation of the patient into volume displacement and volume replacement procedures. The volume displacement techniques uses the remaining breast tissue, while the second, the volume replacement technique, uses other autologous tissue to supplement the insufficient breast tissue [11].

Planning for oncoplastic breast surgery includes selecting the most effective techniques for parenchymal excision and placing accurate preoperative markings on the skin. The breast size and the patients' age, general status, and personal potentials are also taken into consideration [12].

Oncoplastic surgery with the superior pedicle breast reduction technique is useful for the treatment of tumor of the inferior quadrant of the breast from the 3 o'clock to the 9 o'clock position. Obtaining clear margins (the larger, the better) is an essential step in the procedure in order to reduce the cancer recurrence rate. The recurrence rates are influenced by the tumor size, the tumor type, vascular invasion, multicentric disease, and the age of the patient.

With good consideration of risk factors for recurrence biologically and anatomically, superior medial technique is a good option for selected node-positive breast cancer patients.

The Wise pattern is the most commonly used incision for reduction mammoplasties, which offers the surgeon wide access to the breast parenchyma and allows skin excision in both vertical and horizontal dimensions, and can be used with any pedicle [13].

With one million new cases in the world each year, breast cancer is the most common malignancy in women and comprises 18% of all female cancers. In the United Kingdom, where the age standardized incidence and mortality is the highest in the world, the incidence among women aged 50 years approaches two per 1000 women per year, and the disease is the single most common cause of death among women aged 40–50 years, accounting for about one-fifth of all deaths in this age group. There are more than 14 000 deaths each year, and the incidence is increasing particularly among women aged 50–64 years, probably because of breast screening in this age group [14].

Surgeons embarking on Oncoplastic surgery (OPS) should be aware of the risk of complications and the factors that increase this risk. Glandular necrosis is the most challenging complication. Aggressive undermining of both the skin envelope and the gland from the pectoralis muscle can lead to glandular necrosis if the breast is fatty. Areas of fat necrosis can become infected and cause wound dehiscence resulting in postoperative treatment delay [15].

In the last two decades, this new form of breast surgery has developed rapidly not only due to the improving scientific background with better clinical studies but also due to the increasing attention given by surgeons to their patient's quality of life. Increasing numbers of scientific papers and meeting abstracts about the oncoplastic techniques demonstrate the importance of and increasing attention given to this technique. The goal of improving a breast cancer patient's quality

of life by introducing breast-conserving treatment in the early 70s has now finally been achieved by the introduction of oncoplastic techniques [16].

All our patients had the tumor in the lower outer and lower inner aspects of the breast except two (10%) patients who had the tumor in the upper outer aspect, as the upper outer quadrant is the most common site of breast cancer.

In our study, only five (25%) cases have had complications, three cases got wound infection, and two of them were diabetics reflecting the immune compromization 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 [1] showing the complication of diabetes mellitus in oncoplastic surgery.

Those who had wound infection were treated with admission, parenteral antibiotics, and frequent daily dressing with saline and topical antibiotics. The infection was eradicated within 2–3 days in two of the three patients and the patients were discharged on oral antibiotics with a more frequent follow-up schedule, the third patient needed secondary suturing after treatment of the infection.

We reported lower results of surgical site infection (15%) than that reported by Vilar-Compte *et al.* [17] (18.9%) and higher than that reported by Olsen *et al.* [18] (4.7%).

Another two cases in our study had wound ulcer with an incidence rate 10%, it was discovered in the second week postoperatively. None of them had any other complications. For both patients the ulcer was the result of the heavy weight of the breast exerted on the skin of the breast even after reduction as both patients had a breast cup size G, both patients were treated with topical antibiotics, topical reepithelialization ointments and daily dressing until full recovery.

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.The operative duration of our study was long at first (155 min) but with progression of our study and as we build up more experience the operating time was reduced to 90 min.

One of our last cases had long operative duration as the patient had breast cup size G which required large-volume dissection.

In our study, none of the patients had any malignant recurrence as confirmed by the pathologist in our MDT proving that we had performed a superior medial technique safely from the oncological point of view. The follow-up of the malignant recurrence was for the first 6 months as this was the time limitation of our study.

Annual recurrence curves indicated that the relapse peak after mastectomy emerged in the first 2 years; however, recurrence after conservative breast surgery increased annually with the highest peak near 5 years as shown by most of the studies [15].

This new combination of oncologic and reconstructive surgery is commonly referred to as oncoplastic surgery. This 'third pathway' allows the surgeons to extend the indications for BCS without compromise of oncologic goals or the esthetic outcome. It is a logical extension of the quadrantectomy technique described by Inas *et al.* [19]. With immediate reshaping employed through OPS, major resections can now be achieved with enhanced cosmetic outcomes [19].

In our study, we were able to conduct an excellent cosmetic outcome for relatively large tumor excisions with 70% (14 patients) of the cases falling in excellent and very good score groups with a mean cosmetic outcome score of 4.26. Another 20% (two cases) which fall in good and fair score groups as those two patients noticed asymmetry of the two breasts in front of the mirror as they refused bilateral breast reduction mastopexy. None of our cases have had a poor or an ugly score.

Conclusion

The combination of plastic surgery techniques with breast oncology surgery gives the surgeon a new tool for the treatment of breast cancer. This approach has enabled us to increase the number and extend the indications of breast-conserving surgery with wider margins offering safer oncologic control with more satisfactory cosmetic outcome. The choice of the oncoplastic technique is mainly based on the location of the tumor, size of the breast, and distance of the tumor from the NAC. So, all cases should be adequately reviewed in order to tailor the decisions for every single case.

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Conflicts of interest

There are no conflicts of interest.

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