



ORIGINAL ARTICLE

Surgical Outcome of Oncoplastic Breast Surgery for Patients with Breast Cancer: A Single Centre Experience

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ABSTRACT

Background: This research was carried out to capture a single-center experience regarding the possibility of using of oncoplastic breast reduction for women presenting with cancer breast and large breast volume in terms of oncological safety and aesthetic outcome.

Methods: We looked back at the records of all women who had operable, stage II–III cancer breast, and received reduction mammoplasty to treat their cancer along with simultaneous cosmetic reduction mammoplasty of the opposite breast from the period October 2018 to June 2021 at Suez Canal University Hospital. The breast Q Questionnaire was used to assess patient satisfaction both before and after surgery. The primary outcome of our work was to figure out if oncoplastic breast surgeries can introduce valuable advantages such as reasonable operating time, a very low occurrence of complications, prompt delivery of adjuvant therapy, favorable cosmetic outcomes, and high patient satisfaction for females with cancer breast and large breast volume (gigantomastia type 1).

Results: There were 36 patients altogether involved. The mean age was 45.5 ± 8.5 years, and mean body mass index (BMI) was 31.7 ± 3.7 kg/m². 58.3% of the patients had breast cup size D. Stage III was the commonest 47.2%. The average specimen weight was 187.65 (±215.83). The commonest site for breast cancer was the upper outer quadrant (44.4%), followed by the upper inner quadrant (25%). We used wise pattern (inverted T) mammoplasty with inferior pedicle for tumors of upper quadrants (69.4%) and wise pattern (inverted T) mammoplasty with superomedial pedicle for tumors of the lower pole (27.7%) and inverted T with nipple-areola complex excision for central tumors (2.7%). The mean follow-up was 18.5, SD 8.1 months. About 8.3% of our patients developed surgical site infection, 13.8% had postoperative seroma and 8.3% had fat necrosis. Patient satisfaction regarding their breasts improved from 47.9 preoperatively to 67.3 postoperatively and this difference was statistically significant. During the follow-up, none of the cases experienced local recurrence. **Conclusions:** This retrospective study clarified that treating breast cancer patients with oncoplastic breast surgery can achieve satisfactory aesthetic outcome with accepted oncological safety and a low complication rate, yet long-term studies and regular training programs are still needed especially in developing countries.

Keywords: Breast reconstruction; Breast Conservation Surgery; Breast Cancer; Mastectomy



INTRODUCTION

With age-standardized incidence rates (ASIRs) of 19.7 cases per 100,000 premenopausal females and 152.6 incidences per 100,000 postmenopausal females, breast cancer is one of the most prevalent malignancies in women globally [1]. It is also thought to be a cancer that affects Egyptian females the most frequently. It is one of the main causes of female fatalities and accounts for roughly 38.8% of all malignancies in Egyptian women [2].

Breast-conserving therapy (BCT) has grown more popular and is now the main therapeutic option for the

earliest stages of breast cancer because of surgical innovation. Breast conservation surgery (BCS) followed by radiotherapy as a treatment possess nearly similar rates of survival and tolerable rates of incipient breast cancer recurrence compared to complete mastectomy alone [3].

Due to the necessity to preserve the aesthetic results of surgery while yet upholding oncological principles, oncoplastic breast surgery was developed. Better cosmetic results that won't stigmatize patients after surgery are needed, even though breast surgical

oncologists will always prioritize safe and adequate tumor excision [4].

To obtain oncological and aesthetically pleasing results, oncoplastic breast surgery (OBS) blends the fundamentals of cosmetic surgery and oncology [5]. Additionally, oncoplastic breast surgery broadens the criteria for breast conservation, allowing the removal of tumors that are far larger than expected given the size of the breast. In the past, removing the entire breast was the available surgical solution for tumors 4 cm and above together with in-depth sophisticated malignancies that responded to chemotherapy. Now, there is an alternative called oncoplastic breast surgery [6, 7]. In some cases, oncoplastic treatments are essential for the patient to receive radiotherapy, a crucial component of breast-conserving treatment, in addition to being helpful for an appropriate cosmetic outcome following extensive breast resection [8]. Volume replacement techniques, which mobilize local glandular flaps and distribute them to the resection defect, are the main focus of this study. Volumetric displacement methods, which use the latissimus dorsi flap and lateral thoracic advancement, involve harvesting autologous tissue from a distant site and transferring the flap into the resection defect [2].

This is especially important for people who have gigantomastia. The rare illness known as gigantomastia, which causes breast development that is excessive, may be physically and psychologically debilitating to women. The threshold for gigantomastia was established by many writers at a breast excision weight of 1 kg [9, 10]. Preoperative midclavicular to nipple distance of 38 cm minimum was also involved by Karacor-Altuntas and his associates in their criteria for patient selection [10]. We chose to use this standard in our study to help with our inclusion criteria.

Enormous breast volume is known to be an important danger signal for developing instantaneous skin toxicity and delayed side effects after radiation [11-12]. Females with cancer breast and gigantomastia are more likely to experience severe cutaneous side effects after radiotherapy. Breast cancer management that is safe from a medical standpoint for those patients without a significant breast reduction operation would be a mastectomy [13]. For these individuals, during cancer surgery, the breasts can be elevated using a local flap and skin reduction, and after tumor excision, the breast parenchymal tissue can be preserved using a combined reduction mammoplasty and breast reconstruction technique [14].

A gigantomastia is a breast development that is high and exceeds 1.5 kg per breast, according to Dancy et al. In line with etiology, they divided the illness into three categories in their seminal study. The first group

can be treated with a breast reduction from the start because it is idiopathic in origin and quiet in its course. It often has a good prognosis. This study will focus on this group [15].

Even though the scar is rather long, postoperative female contentment is very good [16]. In addition, obtaining a better breast shape while treating cancer compared to primitive breast reconstruction to improve the look prior to surgery may help patients psychologically cope with cancer therapy [17]. Although an inverted T incision is commonly used for the reduction mammoplasty, different procedures may be more appropriate depending on the location of the pedicle or the site of breast cancer. However, after conducting breast reduction for reconstruction following mastectomy, there is currently no proven therapy for cosmetically matching the size and shape of the other breast. In gigantic or pendulous breasts, particularly when the malignancy is close to the reducing strategy.

We conducted this work to evaluate the oncological safety and aesthetic aspects of oncoplastic breast reduction for women presenting with breast cancer and large breast volume.

METHODS

The retroactive nature of the study allowed for the waiver of the requirement for written informed consent. The standards set forth in the Helsinki Declaration are followed by all procedures [18].

Study design and Patients:

Retrospective analysis was done on all patients with breast cancer and type 1 gigantomastia who received oncoplastic breast surgery as their main treatment in Suez Canal University Hospital through the period from June 2018 to June 2021. Unilateral or bilateral T1-3 N0-2 M0 tumors were included. A midclavicular point to nipple distance of 38 cm minimum and 1 kg specimen weight at least were used to characterize gigantomastia. Only those ladies were included who had a biopsy-confirmed diagnosis of breast cancer and had never received therapy before. We did not include records of patients with inflammatory disease, metastatic disease or cases requiring neoadjuvant radiotherapy.

Study Procedures:

In order to determine which patients were eligible, we first gathered baseline information on them, including their demographics, examination results, and breast imaging results, medical comorbidities, tumor characteristics, the eligibility for surgery, midclavicular point to nipple distance, resected sample weight, the kind of oncoplastic method used, re-excision rate, complications, involved surgical margin involved, contentment, follow up, local tumor recurrence and distant metastasis rate were

incorporated to assess the outcomes. All patients underwent these techniques according to their desire. These patients were operated on by the same surgical team. Aesthetic satisfaction was verbally obtained from the patients one month postoperative. Patients were followed either phone call or in outpatient's clinic. Adjuvant radiation was given to all patients as a normal part of breast conserving therapy, and also continued chemotherapy after surgery as decided by the MDT. In order to give time for the post-radiation skin alterations to settle down, the aesthetic result was evaluated using the Breast-Q questionnaire at a median of 6 months after having adjuvant radiotherapy. The doctor asked the patients questions on their physical and physiological well-being and post-operative satisfaction with their breasts, and a scale of their responses was recorded. Using the Breast-Q questionnaire, the primary purpose was to measure patient satisfaction. Postoperative problems that occurred within six months were the secondary goal.

In our facility, the Wise pattern therapeutic reduction mammoplasty was the primary oncoplastic method. For women with breast cup sizes of C, D, or DD, this adaptable approach is the best choice. Before surgery, a skin pattern and NAC pedicles are created allowing for the removal of the tumor and the filling of the tumour cavity defect with the remaining breast tissue based on the tumor site, degree of breast ptosis and the size of the breast cup. While inferior pedicle reduction mammoplasty was the best option for patients with upper quadrant tumors, therapeutic superomedial pedicle reduction mammoplasty was chosen for lower quadrant tumors. This was also applied to tumors that fall outside the Wise pattern by shifting tissue and rotating the reduction pattern. A wise pattern mammoplasty with NAC resection were adopted for central tumors, the breast was removed around the NAC, and the complete breast's symmetry was achieved by transposing the skin of the inferior area to be deepithelized. This provided significant advantages in the NAC reconstruction that followed

Study Outcomes:

The main finding of this research was to assess women contentment using the Breast-Q questionnaire for females presenting by breast cancer and large breast volume (gigantomastia type 1), while the secondary objective was to detect recurrence rate post oncoplastic breast surgery for breast cancer patients.

Statistical analysis:

Data entry and analysis were done with SPSS version 26. and presented using tables and graphs. The qualitative variables were expressed by frequency and percentage, and the quantitative variables were described by range, mean, standard deviation (SD).

We employee descriptive statistics to describe the patients' age, BMI, cancer stage, breast surgery, and reconstruction method were recorded. By examining the profile (projection and width) of the reconstructed nipple in images taken prior to surgery and at three, six, twelve, and eighteen months following surgery, information regarding breast symmetry was gathered. Data from questionnaires for women satisfaction during and after surgery were also obtained and analyzed at 6 months.

Acceptance of participation and ethical clearance:

Suez Canal University Hospitals obtained the official endorsements of the relevant ethical commission.

RESULTS

There were 36 women in total, and their average age was 45.5 ± 8.5 (minimum / maximum was 25/60 years old). Of them, 8 (22.2%) were cup size C, 21 patients (58.3%) cup size D and 7 patients were cup DD (19.4%) (Figure 1). The mean BMI was 31.7 ± 3.7 kg/m². The midclavicular to nipple distance mean was 42 (R 38-47). The mean tumor span was 3.19 ± 1.1 (**Table1**). Stage III (47.2%) was the pathogenic stage that was most frequently found, followed by stage IIB (33.3%) and stage IIA (19.4 percent) Stage III (47.2%) was the pathogenic stage that was most frequently found, followed by stage IIB (33.3%) and stage IIA (19.4 percent). Invasive ductal carcinoma was to blame for most of the patients (75%). Most of the patients had grade II cancer (52.7%). 17 patients (47.2%) were estrogen-receptor (ER)-positives, 36.1% were progesterone receptor (PR)-positive, and 25% of the patients were HER-2 positive. Nearly 16.6% of the cases were triple negative (table 2). Only 6 patients received neoadjuvant chemotherapy while the remaining 30 patients received adjuvant chemotherapy and the whole 36 patient received radiotherapy as a part of the conservative breast surgery. The incidence of Lt side cancer was more than the right 22(61.1%) versus 14 (38.8%) figure (1). 16 patients (44.4%) had upper outer quadrant breast cancer and only 1 patient had Central cancer (2.8%) (Table 3). We adopted the wise pattern (inverted T mammoplasty) for all breast cancer patients with inferior pedicle for cancer in the upper pole (69.4%), superomedial pedicle for cancer in the lower pole (27.7%) and wise pattern with NAC resection for central tumors (2.7%). Out of the 36 patients who had oncoplastic mammoplasty, only 4 patients (11.1%) had SLND while the remaining 32 patients (88.8%) had ALND. The most common postoperative complication was seroma accounting for 13.8% of the patients (table 4). Postoperatively, the mean specimen weight was 187.65 ± 215.93 , the mean surgical margin was 2.2 ± 0.52 (R 1.5-7) and the mean follow up period was 18.5, SD 8.1. During the follow up no patient developed local recurrence and only 2

(5.5%) developed distant metastasis both in the bone. The mean hospital stay was 3.2 (2-5) day. Patient satisfaction with breasts as measured by the mean Breast-Q score was 47.8 ± 20.8. preoperatively compared to 67.2 ± 18.8 postoperatively and this difference was statistically significant (P 0.0001). The

mean score for psychological wellbeing was 63.1 ± 20.1 preoperatively, compared to 72.6 ± 18.1 postoperatively (p 0.0067-) and the mean score for physical wellbeing wasn't statistically different between pre and post-operative, 70.1 ± 18.3 versus 72.0 ± 14.3 (p 0.5300).

Table 1: Patient & Tumor demographics

N=36	Mean SD
Age	45.5 ± 8.5 Yrs
BMI	31.7 ± 3.7 Kg/m2
Midclavicular to Nipple Distance	42.2 (R 38-51)
Tumor Span	3.19 ± 1.1 (R 2-6)

Table 2: Breast cancer grading & staging

N=36	N/Percentage	
TNM staging	IIa	7 (19.4%)
	IIB	12 (33.3%)
	III	17 (47.2%)
Grade	I	9 (25%)
	II	19 (52.7%)
	III	8 (22.2%)
Hormonal Receptor Status	ER+	17 (47.2%)
	PR+	13 (36.1%)
	Her 2 +	9 (25%)
	Triple negative	6 (16.6%)

Table 3: Breast cancer location

N=36	N (%)	
Site	Rt	14(38.8%)
	Lt	22 (61.1%)
Quadrant	UOQ	16 (44.4%)
	UIQ	9 (25%)
	LOQ	7 (19.4%)
	LIQ	3 (11.11%)
	Central	1 (2.7%)

Table 4: Postoperative complications

Complications	N/percentage	
Wound Infection	3 (8.3%)	
Wound gapping	Healed by secondary intention	1 (2.7%)
	Needed Resuturing	1 (2.7%)
Seroma	5 (13.8%)	
Fat necrosis	3 (8.3%)	
NAC sensation loss	4 (11.11%)	
NAC necrosis	Partial	2 (5.5%)
	Complete	0%
Local recurrence	0%	
Distant Metastasis ⁵	2 (5.5%)	

Figure 1

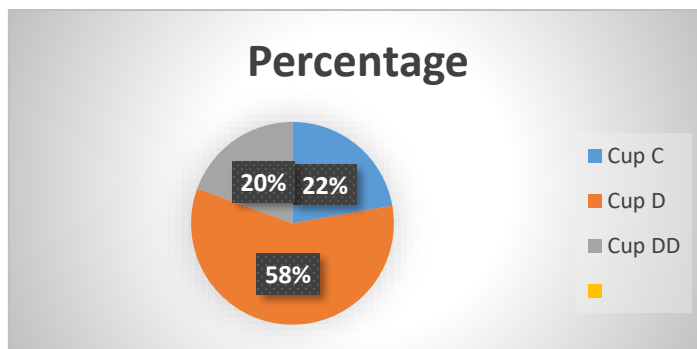


Figure 2: 39 years old female patient presented with Lt lower outer quadrant breast cancer, Stage III A and received inverted T mammoplasty with superomedial flap reconstruction.



Figure 3: 33 years old female patient presented with Rt Upper outer quadrant breast cancer (invasive ductal carcinoma) , stage IIB and was treated with inverted T reduction mammoplasty with inferior pedicle and ALND.

DISCUSSION

The objectives of breast cancer surgery have not been altered throughout time, despite evolution: full eradication of the tumor with the least amount of

breast deformity and negative margins. Due in part to the present good life expectancy following breast cancer treatment, the aesthetic outcomes following breast cancer surgery have taken on increased

importance [19]. Therefore, over the past ten years, oncoplastic breast-conserving surgery (OPS) has significantly increased in popularity. Combining the fundamentals of plastic and reconstructive surgery with surgical oncology along the potential for greater resection margins helps maximizing the oncological safety and aesthetic advantages [20]. Therefore, compared to breast-conservation surgery alone, OPS may be linked to a decrease in conversions to mastectomy and a decrease in re-excision rates leading to expansion in the scope of conversion [21]. Breast hypertrophy or gigantomastia is defined according to the classification of Lalardie–Jouglard., as mammary growth of more than 800 g and with a sternal notch-to-nipple distance above 32 cm. Gigantomastia, negatively affects a woman's quality of life on a physical and psychological level [22, 23]. Particularly when paired with breast cancer and breast-conserving surgery is taken into consideration, gigantomastia could be challenging to treat. An essential component of breast-conserving surgery is adjuvant radiation. The huge size of the breast in these patients may make it challenging to administer radiotherapy. A therapeutic mammoplasty with sufficient volume reduction becomes the preferred operation in this group as a result. Because gigantomastia patients are more likely to experience complications, they need particular procedures and concerns. A well-known procedure, the inferior pedicle technique is very helpful for reducing very big breasts [24, 25]. Even while the algorithm for reduction mammoplasty in cases of big or ptotic breasts has been developed, it has not yet been combined with cancer breast surgery. Through the current research, we attempted to figure the best possible option for patients who want a contemporaneous breast reduction while having a breast conserving surgery for cancer breast based on the analysis of the patient's data regarding the postoperative complication rate and the highest aesthetic outcome. For the reduction mammoplasty, a number of methods have been published, involving inverted T reduction mammoplasty technique using the superomedial or inferior pedicle. This combo method can be used on females with cancer breast who have enormous or ptotic breasts and desire to have them reduced or undergo a mastopexy to adjust the breast's breadth, projection, and height [26-28]. Through the current work, if a woman present with tumor in the lower quadrants (31%), the superomedial pedicle was performed during Surgery (figure 2) while when the patients had tumors in the upper quadrants (69%), the inferior pedicle was used (figure 3). Research participants who had tumors in the central region (2.7%) had their breasts excised around the NAC, and the skin from the inferior part of the

deepithelized breast was transposed to create the symmetry of the entire breast. This provided significant advantages in the NAC reconstruction that followed. Following surgery, radiation and chemotherapy could be carried out without any significant issues, and patient satisfaction was mostly upheld more than a year later. Radiation and chemotherapy following surgery were carried out without any significant issues, and women contentment was maintained reasonably well after more than a year. Others have employed such modalities like intraoperative specimen x-ray assessment whereas we have used intraoperative frozen section to evaluate the status of the resection margins. Comparing frozen section analysis to paraffin section analysis, the frozen section exhibits a sensitivity of 83% and an accuracy of 96% [29]. The mean surgical margin in our study was 2.2 ± 0.52 ranging from 1.5 to 7 cm. From the 61 patients who received therapeutic mammoplasty, five individuals (8.2 percent) had infiltrated margins, according to Caruso et al. [30]. Additionally, additional studies have discovered that when using oncoplastic breast surgery procedures in comparison to breast-conserving surgery alone, positive margins appear to be less common [31]. This series did not find any local recurrences and 5.5% distant metastasis. This could be explained by the fact that there were not very many patients, as well as the brief follow-up period. In their analysis of 148 patients, Rietjens et al. found that a 5-year local recurrence rate of 3% and a distant metastasis rate of 13% were comparable to our findings [32]. According to Rietjens et al. [32] and Fitoussi et al. [33], the typical specimen weight was 187 g. Similarly, the average specimen weight in our study was 187.65 ± 215.93 gm. The patient's life and oncological treatment are significantly affected by complications that arise after breast surgery [34, 35], since they may cause the beginning of adjuvant chemotherapy or radiotherapy to be delayed [36, 37]. No participant in our resereach have had a delay in adjuvant treatment, in contrast to Rose et al. who reported that 6 percent of their cases had adjuvant treatment delays brought on by slow wound healing [38]. The BREAST-Q questionnaire was used in this study to assess patient satisfaction, which is regarded as a key outcome metric after oncoplastic breast surgery. In most fields, scores were higher than the average. The mean score for patient satisfaction with their breast improved from 47.8 preoperatively to 67.2 postoperatively and this difference was found to be statistically significant. The lowest scores were found in the domain of physical well-being of the chest," both with a mean score of 72 postoperatively compared to 70 preoperatively. A nearby results were

obtained by Rose et al. in a research that examined the BREAST-Q results following oncoplastic breast surgery with breast-conserving surgery. With a median score of 65 for psychological well-being and 63 for satisfaction with one's breasts, patients were generally satisfied [39]. Other research on the subject, though, had greater results than the one we are doing right now [40, 41]. In contrast to our work, there are some notable differences: participants were younger, underwent various sorts of reconstructions, or had little breasts (cup B or smaller) inserted.

The study's primary weaknesses were primarily related to its retrospective design, which could result in underestimated incidence rates because of selection bias and loss to follow-up. Only data from one breast unit's limited (n=36) patient population with an 18-month follow-up were described in this study. We must continue patient recruiting in order to expand the sample size and guarantee long-term follow-up in order to get around these restrictions. A multicentric study will be required in the future to prevent investigator bias. Another drawback of this research is that only one procedure—inverted T reduction mammoplasty was utilized. The deletion of numerous items from the Breast-Q questionnaire, which was used to gauge women satisfaction, may have introduced selection bias into the data. Since both breast and plastic surgeons were part of the surgery teams, it is possible that these results cannot be logistically replicated in all centers.

Conclusions: This work clearly demonstrates that properly selected patients who suffer from breast cancer with large breasts can be effectively treated by therapeutic mammoplasty with an inverted T incision. This technique can be considered as a safe and feasible surgical option for such patients, without compromising oncologic principles or esthetic outcomes yet further studies still needed to support evidence.

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