International Journal of Medical Science and Clinical Invention 12(08): 7674-7776, 2025
DOI:10.18535/ijmsci/v12i.08.02
https://valleyinternational.net/index.php/ijmsci

A Single Center Experience; Therapeutic Mammoplasty and Local Perforator Flaps as an Extreme Oncoplastic Measure

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Abstract

Introduction: Extreme oncoplastic breast surgery involves utilizing OPBS (Oncoplastic Breast Surgery) techniques to preserve the breast in a patient who, according to many surgeons, should have a mastectomy, for example, large tumors (>5cm), multifocal/multicentric tumors in A/B cup size breast.

We are reporting our early experience as a single center to assess the oncological safety and cosmetic results of intercostal perforator flap (LICAP and AICAP) and therapeutic mammoplasty as extreme OPBS measures in patients who were given OPBS instead of the planned mastectomy at the initial surgical consultation.

Method: Retrospective analysis of patients having Extreme OPBS in cases where a mastectomy would typically be recommended. Patients were included if their imaging revealed tumors larger than 40 mm or smaller in A/B breast Cup or if the tumors were multifocal or multicentric.

Results: From October 2022 to November 2023, 20 patients underwent extreme OPBS. The tumor sizes range from 0.7 cm to larger than 7 cm, with a median of 4 cm. The Oncoplastic procedures for which these patients underwent include LICAP performed in 8 patients, AICAP in 1 patient, mammoplasty in 10 patients, and bilateral donut mastopexy in 1 patient. In 20 patients, 8 underwent single-stage symmetrizing procedures. All patients had axillary surgery such as SLNB (Sentinel Lymph Node Biopsy), TAD (Targeted Axillary Dissection), and ALND (Axillary Lymph Node Dissection). All margins were negative on final histopathology.

Conclusion: In our data, we have shown that the indications for Extreme OPBS can be safely expanded to patients who would traditionally only be considered for mastectomy based on tumor size or multicentricity. However, longer follow-up will be investigated in the future.

Introduction:

Breast surgical oncoplasty is an emerging approach in breast cancer patients. Surgical oncoplasty is a form of breast-conserving surgery that includes margin-free oncological resection and reconstructive breast surgery, either by volume replacement or displacement, allowing for the preservation of the breast mass whilst removing the cancerous lesion with clear margins. Traditionally, depending on many factors such as tumor extension and breast size, a mastectomy would be the offered option for a lady with a large tumor and small breasts, but that is not the case today. Although breast-conserving surgery (BCS) has already been established, many patients still undergo mastectomy. Extreme oncoplastic breast surgery involves utilizing oncoplastic techniques to preserve the breast in a patient who, according to many surgeons, should have a mastectomy, for example, large tumors (>5cm), multifocal/multicentric tumors, or A cup breasts (1,2,3).

In this paper, we are reporting our experience as a single center to assess the cosmetic results and oncological safety of the intercostal perforator flap and therapeutic mammoplasty as extreme oncoplastic measures in patients who were given a chance of oncoplastic surgery instead of the planned mastectomy at the initial surgical consultation.

Methodology:

We will report our experience in a series of twenty patients. This is a retrospective study over 1 year, including breast cancer patients undergoing breast-conserving surgery where a mastectomy

would traditionally be recommended to achieve oncological safety and acceptable cosmetic results. Patients are included if the radiological tumor extension is more than 40 mm or less in a small breast cup, if the tumor was multifocal or multicentric, or if the mass is occupying more than one quadrant, aiming to excise the original tumor footprint. We excluded male patients, patients with inflammatory breast cancer, patients who are not candidates for BCS, such as those who have been exposed to radiotherapy, and patients with metastatic disease. Various data were collected, such as co-morbidities, type of surgery, neoadjuvant therapy, hormone receptor status, axillary staging method, and length of stay.

Results and Analysis:

All data of the study population were carefully analyzed using SPSS 27, with qualitative data presented as frequencies and quantitative data as mean or median, depending on symmetry. From October 2022 to November 2023, twenty patients underwent extreme oncoplastic breast conservative procedures. The most extended follow-up period is up to 1 year. As shown in Table 1, our population's average age was 48.5 years, with variant cup sizes like A, B, C, D, and double D (DD), but the majority had cup sizes B-D. The most common co-morbidities among our patients were hypertension (HTN) and Hypothyroidism. Four out of twenty patients had bilateral breast lesions. The sizes range from smaller measurements, such as 0.7 cm and 2.5 cm, to larger dimensions of 6.5 cm and 7 cm, with a median of 4 cm. The localization of the tumor within the breast was recorded based on quadrants. The descriptions range from specific quadrants to combinations of quadrants, demonstrating variability in the localization of breast cancer among our patients. The majority of patients had ductal invasive cancer (14 out of 20) and grade 2 tumors, with one patient who was identified as having a high-grade DCIS (Ductal Carcinoma In Situ). Analyzing the estrogen receptor status reveals that most patients (16 out of 20) exhibit positive ER (Estrogen Receptor) expression, and 16 out of 20 show positive PR (Progesterone Receptor) expression. Half of the population registered as HER2 (human epidermal growth factor receptor 2) positive. Examining the Ki67 index, which is a marker for proliferation, patients exhibit varied ranges from 10 to 90. Moreover, 50% of our population received neoadjuvant chemotherapy (NAC). Among the ten patients who received neoadjuvant therapy, six patients exhibited a complete radiological response (CR), while the remaining patients had a partial radiological response (PR). Among our patients, fourteen opted for SAVI, while the remaining six did not. The oncoplastic procedures for which these patients underwent include lateral intercostal artery perforator flaps (LICAP) performed in 8 patients, anterior intercostal artery perforator flap (AICAP) in 1 patient, mammoplasty in 10 patients, and bilateral donut mastopexy in 1 patient. In twenty patients, 8 underwent single-stage symmetrizing procedures. All procedures were in conjunction with axillary staging procedures such as sentinel lymph node biopsy (SLNB) done in the majority of patients, targeted axillary dissection (TAD) in 4 patients, or axillary lymph node dissection (ALND) in 4 patients. For all the patients, mammogram analysis of the surgical specimen was done intraoperatively. All margins were negative on final histopathology. There were no positive margins necessitating additional surgery. Thirteen patients showed positive results for DCIS on final histopathology. The majority of admitted patients were discharged in less than 24 hours, and only two patients had 2 days of admission for pain control. None of the patients required admission to the Intensive Care Unit (ICU). All patients underwent adjuvant radiotherapy as part of the breast-conserving surgery approach. Four individuals tested positive for metastasis, three with metastasis to the lung and one to the brain. The data reveals few complications reported by patients, such as axillary seroma, cosmetic issues, and post-radiation complications. Most of these did not experience any major complications during their course of treatment. However, one patient had an axillary seroma. Cosmetic issues emerged as an area of concern for four patients facing issues related to dented nipples, wide breasts, and unsatisfactory nipple position. Notably, two patients experienced post-radiation mastitis as a specific complication associated with radiation therapy.

Discussion:

Oncoplastic procedures have been validated around the world, with no reporting difference in recurrence rates compared to BCS. Although it

may seem a novel approach in our population, this paper attempts to report our current practice with extreme oncoplasty. In our paper, we reported twenty breast cancer patients with a lesion mean size of 4cm, who underwent extreme oncoplastic procedures. Our primary outcomes were cosmetic results and tumor margins. Regarding the margin, negative margins were defined as per the census as no tumor cells within 2mm. We reported only one case that had close margins less than 1 mm, and after tumor board discussion, she was referred to radiation oncology without requiring re-excision surgery.

As for the cosmetic results, most patients expressed verbal satisfaction with the results immediately after surgery and in the clinic follow-ups. However, an objective measure of patients' satisfaction is mandated.

According to Awad et al, to assess the aesthetic results, they used a scoring system and questionnaire named BITS (Breast Impact Treatment Scale). They started the aesthetic evaluation after the patient received radiotherapy. The follow-up period with aesthetic assessment was as follows: every 3months for 1st year, then every 6 months for the 2nd year. The BITS questionnaire includes 15 points, and the average scores of the visits are recorded. They compared the recorded score between the first visit after the radiotherapy and after 24 months, and it showed a statistical difference of ($p<0.05$) (1). Another important point to consider is the single-stage symmetrizing procedures that most of our patients underwent, which eliminates extended hospital stay, cost, and readmission for any further corrections of surgical defects after the initial breast reconstruction surgery.

Since this is a new approach in our institution, we reported a small sample size, and what may be incomplete follow-up periods to measure any local recurrence. Since this paper's primary goal is to broadcast our early results, further follow-up of these patients will be reported as an ongoing study.

Some patients in our data had multiple ipsilateral breast lesions. A similar paper reported the cosmetic outcomes among patients with MIBC (Multiple Ipsilateral Breast Cancer) who underwent BCS, and according to Kari et al (Z11102), they reported excellent results for cosmesis in most patients, using a validated tool called BREAST-Q. In their paper (Z11102), a multicenter study was conducted that enrolled patients with two or three proven malignancies, separated by 2cm or more in the same breast. Then the patient would undergo BCS with single or multiple incisions, and oncoplastic measures with cavity replacement and/or reconstruction were done (4).

Multifocal multicentric breast cancer was known as a contraindication to BCS. In Masannat et al's paper, they revised the literature, and most studies in the paper showed no significant difference in the overall disease survival, although it is established that multicentric disease has a worse prognosis. Indicating the current evidence that advocates for BCS as an option for patients with multifocal/ multicentric disease, with no significant difference in overall disease-free survival (5).

In Kopiker et al's paper, they reported similar complications post extreme oncoplasty, such as post-radiation complications. As is known, radiotherapy is an integral part of BCS to control local disease recurrence. However, it increases the risk of specific associated complications like capsule retraction if implant-based construction is being used. In our paper, two patients experienced post-radiation mastitis (2).

In a Dutch paper by Wijgman et al, they reported the short-term safety of oncoplastic breast-conserving surgery. They compared patients who underwent standard BCS in the form of lumpectomy compared to patients who underwent oncoplastic breast-conserving surgery; the reported complications, such as infection, hematoma, or seroma, were not statistically significant between the two groups. Unlike our paper, they reported higher rates of positive margins in the OPS (oncoplastic surgery) group (22.8%) compared to the standard BCS group (18.2%). Patients in the OPS group had second re-excision surgeries, and most of these patients had histological evidence of DCIS (3).

Conclusion:

In summary, we reported our experience in a review series of twenty patients. The oncological safety of oncoplastic breast surgery has been validated in the literature, but lacks larger proportions of research. An area that needs better implication is the use of pre-made questionnaires, which need to be suited for our population based

on social and religious factors. We will continue to follow these patients for more extended periods and report our new practice in hopes of a bigger sample for validation.

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Appendix:

Table 1: Patient's demographics and tumor characteristics

	Total Sample (N= 20)
Age and registration (Years)	
Mean (SD)	48.55 (10.54)
Median	47.5
Range	(28.0-71.0)
Cup Size	
A	2 (10%)
B	8 (40%)
C	2 (10%)
D	6 (30%)
DD	2 (10%)
Tumor Type	
Ductal	14 (70%)
Lobular	0 (0%)
DCIS	6 (30%)
Histologic Grade	
G1 (low)	5 (25%)
G2 (intermediate)	9 (45%)
G3 (high)	6 (30%)
ER Status	
ER positive	16 (80%)
ER negative	4 (20%)
PR Status	
PR positive	13 (65%)

PR negative	7 (35%)
HER2 Status	
HER2 positive	10 (50%)
HER2 negative	10 (50%)
Received Neoadjuvant	
Yes	10 (50%)
No	10 (50%)
Response to Neoadjuvant	
Complete Radiological Response	6 (60%)
Partial Radiological Response	4 (40%)
Adjuvant Rx	
Yes	20 (100%)
No	0 (0%)

Table 2: Procedure details

	Total Sample (N= 20)
Type of Admission	
Day Case	1 (5%)
Admission <24 hours	19 (95%)
ICU Admission	0 (0%)
SAVI	
Yes	14 (70%)
No	6 (30%)
Surgery Type	
LICAP	8 (40%)
AICAP	1 (5%)
Mammoplasty	10 (50%)
Bilateral donut mastopexy	1 (5%)
SLND	
Yes	18 (90%)
No	2 (10%)
TAD	
Yes	4 (20%)
No	16 (80%)
Mammogram confirmed specimen	
Positive	20 (100%)
Negative	0 (0%)
ALND	
Yes	4 (20%)
No	16 (80%)
DCIS Status	
Positive	12 (60%)
Negative	8 (40%)
Margin	
Negative Positive	20 (100%)

Complications	
Axillary seroma	1(5%)
Cosmetic	5 (25%)
Post radiation seroma	1(5%)