Extreme Oncoplastic Surgery for Conservation of Breast in Locally Advanced, Multifocal and Multicentric Breast Cancer

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Introduction: For individuals with locally advanced, multi-focal or multi-centric breast cancer (MFMC), extreme oncoplastic breast conservation surgery (EOBCS) may be a possibility. By improving esthetic results and oncological safety, Extreme Oncoplasty (EO) expands the indications of breast conservative surgery (BCS) for patients who would otherwise need mastectomy.

Aim of work: To study the feasibility of extreme oncoplastic surgery for conservation of breast in locally advanced multifocal and multicentric breast courser.

Patients and methods: The study is prospective and retrospective, and comprised 40 patients who presented to Menoufia University Hospitals between 2020 and 2024 with tumors ≥ 50 mm or who had MF/MC in two adjacent quadrants. Therapeutic Reduction Mammoplasty (TRM) with immediate or delayed contralateral symmetry was provided to patients with big ptotic breasts (cup D). Lateral mammaplasty procedures were offered to patients with medium-sized breasts (cup B, C) with the same tumor criteria.

Results: Forty patients were included in the study with a median age of 55 years (range 37-70). Clear margins were achieved in 39 (97.5%) patients, 1 (2.5%) patient showed inadequate margins at final histopathology analysis and required a completion mastectomy. None of participants got major complications. Minor complications as delayed healing of wound (17.5%), wound infection and dehiscence that required antibiotics (7.5%), seroma (7.5%), all managed conservatively. Regarding score of satisfaction, were (excellent) in 17 cases (42.5%), (good) in 21 cases (52.5%), and (fair) in 2 cases (5%).

Conclusion: For patients with breast cancer whose tumors are ≥ 50 mm or MF/MC, extreme oncolastic surgery is a good option with a low rate of complications and high patient satisfaction. So, it may be regarded as an oncologically safe alternative to mastectomy.

Key words: Extreme oncoplasty, breast conservative surgery, breast cancer.

Introduction

With the marked progress in diagnosis of breast cancer and lines of treatment which includes better hormonal treatment and chemotherapy, improved radiation therapy techniques, and improved knowledge in breast cancer biology and genetics, overall survival has been improved and resulted in decreased local recurrence rates either with mastectomy or breast conservative surgery.[1]

Since Breast Conservative Surgery (BCS) was considered as standard for dealing with tumours ≤ 30:50 mm with acceptable tumour to breast ratio, BCS techniques ranged from breast remodelling to mammoplasty techniques.[2,3]

Extreme oncoplastic surgery has been emerged to save breasts in patients for whom mastectomy was the treatment of choice. That new techniques were offered for patients with tumour>50 mm, MF/MC tumours in two adjacent quadrants, extensive (DCIS), limited or partial response to neoadjuvant chemotherapy in locally advanced tumours.[4-6]

The therapy of MF/MC breast cancers is difficult since the best surgical strategy is debatable. Mastectomy was thought to be the best option in these situations.[7]

Many prospective randomized studies showed approximately comparable survival rates with mastectomy and breast conservative surgery (BCS) with sufficient negative margins, even after a 20-year follow-up.[8] However, in terms of oncologic safety, oncoplastic surgery for breast cancer produced results that were equivalent to those of conventional BCS in terms of obtaining sufficient negative margins and the same recurrence rates.[9]

In recent years, the technique of "Extreme Oncoplasty" (EO) has emerged as a promising option in selective patients with adequate breasts (cup size ≥B) where in BCS is possible inspite of large volume resections.[10] Therefore, the aim of this study is to analyze the clinical, postsurgical, and patient satisfaction outcomes in an EO study cohort at our breast unit in a different group of patients with higher presentation in advanced stages, lower soscioeconomic standard and diffirent tumour biology.

Aim of work: To study the feasibility of extreme oncoplastic surgery for conservation of breast in locally advanced multifocal and multicentric breast courser.

Patients and methods

Patients who presented to Menoufia university hospitals having tumours ≥ 50mm, or with MF/

DOI: 10.21608/asjs.2025.413616.1229

MC lesions in two adjacent quadrants, between period of 2020 to 2024 were included in the study as prospective (24 patients) and retrospective (16 patients) one, including 40 patients. Patients with distant tumour metastasis, with synchronous other malignancy, missed during follow-up period (5 patients) or those received neoadjuvant chemotherapy (NACT) with unavailable radiological reports were excluded.

All patients were subjected to full history, clinical examination, pathological and radiological assessment for diagnosis and metastatic work up. The study was approved by ethical committee, Menoufia University Hospitals, Institutional Review Board (IRB no: 2/25 SURG 9). Oral and written consents were fulfilled for approval of patients.

Possible complications and risks of surgery were discussed well with patients and close relatives, by the multidisciplinary team formed of medical oncologist, radiologist, and pathologist for a complete assessment. As a rule, EO technique was offered with subsequent counseling with patients refusing mastectomy for cosmetic and psychological reasons, giving patient time of 1 week for decision.

Surgical technique: The techniques in this study started with tumor excision with safety margins designed according to tumour location, extent of tumour, breast cup size, and sometimes patient preference. Each patient was categorized in one of two groups according to breast cup size and breast ptosis. Large ptotic breast (cup D) with tumour≥ 50 mm or MC/MF in two adjacent quadrants, were offered reduction mammoplasty either by a wise pattern or vertical scar skin pattern, with immediate or delayed contralateral symmetrization, **(Figs. 1-3).** Nipple areolar grafting was done in two patients with more central lesions. Other patients with medium sized breasts (cup B, C) with same tumour criteria were offered lateral mammaplasty techniques (Lateral intercostal Artery Perforator Flap (LICAP) **(Figs.4-6)** or Anterior Intercostal Artery Perforator (AICAP) flap or combined).

Fig 1: Large tumor (60mm) in large ptotic breast (cup D).

Fig 2: Skin marking for wise pattern reduction mammoplasty with surgical planning and flap design.

Fig 3: Post-operative after Wise pattern reduction mammoplasty with immediate symetrilization.

Fig 4: Surgical planning and flap design for a tumor 52 mm at upper and lower outer quadrant in medium sized breast (cup c).

Fig 5: Excision of the tumor and preparation for LICAP.

Fig 6: Patient after closure of skin (LICAP).

Tumor localization was done in preoperative session by wire insertion by radiologist using ultrasonography. When negative tumour margins of ≥2 mm was achieved (As per recent international guidelines for BCS for invasive breast cancer[4] with frozen section histopathologist, the decision was made to fill the defect by mobilization of tissues by appropriate internal breast flaps.

Study assessments: Post-operative outcomes were checked and documented with all post-operative complications. We classified these complications as major that required intervention surgically and minor which were managed conservatively.

A standardized Breast-Q questionnaire after 6 weeks postoperatively was utilized to assess quality of life (QoL) and patient satisfaction following EO using the Patient Reported Outcomes Measures (PROMs).

The statistical analysis was conducted using IBM Statistical Package for Social Sciences version 24 (SPSS, Chicago, IL, USA) and Microsoft Excel.

Results

Patients and tumor characteristics: The study comprised 40 patients, whose median age was 55 years old (range: 37-70). The majority of cases (47.5%) had large ptotic breasts of cup size D, followed by medium-sized breasts of cup sizes C and B, which were recorded in the research with percentages of 30 and 22.5 percent, respectively **(Table 1).**

Thirty-two patients (80%) had UF and cT3 tumors, whereas 8 patients (20%) had MFMC tumors in two neighboring quadrants. The median tumor size for UF tumor cases was 59 mm (ranged 51–71 mm) on radiological imaging and 51 mm (Ranged 50–66 mm) on final pathological testing reports. In contrast, the median tumor size for MFMC tumors was 65 mm (ranged 53–95 mm) on MRI study and 28 mm (Ranged 22–58 mm) on final pathology.

The majority of cases (52.5%) were of stage IIB tumors, while the remaining cases (47.5%) were of stage IIA malignancy. 52% of instances (21 patients) had a grade 3 tumor, whereas 48% (19 patients) had a grade 2 tumor. Invasive ductal carcinoma was the most prevalent kind, accounting for 82% of cases, followed by invasive lobular carcinoma (ILC) at 10% and mixed type at 8%. While excision was done according to the main tumor area, even if this area decreased, around 77% of cases (31 patients) obtained NACT with no pathological full response, and 65% of cases (26 patients) had pathological node (+ve).

Adjuvant radiation was administered to the whole breast with or without including lymphatic areas, for every patient. **Table 2** provides the specifics of the procedure that was done.

Only one patient (2.5%) had insufficient margins at the final histopathological examination and needed a second surgical procedure, a complete mastectomy, whereas 39 (97.5%) patients had clear margins of >2 mm. Both an intraoperative frozen slice and a sentinel lymph node biopsy were performed. Eleven (27.5%) individuals had immediate contralateral symmetrization.

Oncological results and complications: The median follow-up length for all patients was 13 months, with a range of 6 to 24 months. No significant complications were found in any of the cases, no readmission was done for any case with median hospital stay of 4 days (Ranged from 2: 7 days) but minor ones such as delayed wound healing (17.5%), seroma formation (7.5%), antibiotic-treated wound infection (7.5%), and

fat necrosis (2.5%) were observed in a small percentage of situations. According the Clavien-Dindo classification, these complications ranged between grade I (3 pts), grade II (3 pts) and IIIA (10pts).

Adjuvant radiation was administered promptly and conservatively to address all of these mild side effects. Satisfaction scores, patients' satisfaction and health-related quality of life (HRQOL) of patients were measured using the BREAST-Q questionnaire and the findings indicated that 17 instances (42.5%) had an exceptional score, 21 cases (52.5%) had a good score, and 2 cases (5%), a fair score.

Table 1: Patients demographic data and tumour characteristics

Characteristics (n = 40)	Extreme	% or range
N	40	
Mean Age	55	(37-70)
NACT	31/40	(77%)
Cup B	9	(22.5%)
C	12	(30 %)
D	19	(47.5%)
UF and cT3 tumors	32	(80%)
MFMC	8	(20%)
stage IIB	21	(52.5%)
stage IIA	19	(47.5%)
Invasive ductal carcinoma	33	(82.5%)
invasive lobular carcinoma	4	(10%)
mixed type	3	(7.5%)
Margins (0.1 – 1.9mm)	1/40	(2.5%)
Margins (>2 mm)	39/40	(97.5%)
Re-excision	Nil	
Mastectomy	1/40	(2.5%)
Immediate contralateral symmetrization	11	(27.5%)
Median Follow-Up	13 months	(6–24)
Hospital stay	Median 4 days	(2-7)

Table 2: Surgical techniques and postoperative complications

Postoperative complications		
Major complications (require surgical intervention)	Hematoma	Nil
	Skin Necrosis	Nil
	Nipple Necrosis	Nil
	Wound Dehiscence	Nil
	Infection	Nil
Minor complications	Haematoma	1 (2.5%)
	seroma	3 (7.5%)
	Dehicience&infection	3 (7.5%)
	Delayed wound healing	7 (17.5%)
	Fat Necrosis	1 (2.5%)
	Cellulitis	Nil
Surgical technique	Wise-pattern reduction mammoplasty	33 (82.5%)
	Lateral intercostal Artery Perforator Flap (LICAP)	5 (12.5%)
	Anterior Intercostal Artery Perforator (AICAP) flap	2 (5%)
	Immediate Contralateral Symmetrisation	11 (27.5%)

Discussion

According to the National Institutes of Health (NIH) Consensus Development Conference, BCS is appropriate for the majority of cases of stage I and II breast cancer in the early ninteenth century and demonstrated survival outcomes that were comparable to those of mastectomy and axillary dissection; however, multicentric tumors and cancers larger than 50 mm were not included.[11]

Recent international agreements made it possible to employ oncoplastic surgery to expand the indications for BCS for bigger or multifocal tumors. Lesions larger than 50 mm are candidates for breast conserving, according to National Comprehensive Cancer Network (NCCN) recommendations. Additionally, according to ACOSOG Z11102 data, multicentricity is no longer a strict contraindication for breast conservation.[12]

The term "extreme oncoplasty," which was initially used by Silverstein et al., refers to a subset of breast conservation surgery (BCS) that is provided to patients whose tumor features would normally need mastectomy.[13] The tumors in these individuals may be larger than 50 mm or exhibit multifocality and/or multicentricity in two neighboring quadrants. The word extreme oncoplasty was first used in 2015, but the treatment, known as radical conservation, was first out in early 2008.[14]

Our findings shown that in 97.5% of 40 patients for whom mastectomy was the only viable choice, our methods achieved clean margins. Local recurrence was 0% over our comparatively brief follow-up period, which lasted an average of 13 months. Our findings about clear margins are similar to those of a 2018 study by Rosenkranz et al. that found that breast conservation is feasible in cases of multiple ipsilateral breast cancers. The study also found that conversion to mastectomy was low (7.1%) and that 67.6% of cases had negative margins.[15]

Of the 66 patients in the first Silverstein et al. research, 83 percent had a clean margin; only 4 patients (6.1%) required conversion to mastectomy following EOS, and 6 patients (9.1%) needed re-excision to get broader margins.[14] In a bigger research of 111 instances, Crown et al. used the wise pattern reduction mammoplasty technique with contralateral remodelling for symmetry in the same session. Re-excision was required in 37% of patients (42 cases) because of invaded margins, and 15% of cases were converted to mastectomy. The significant percentage of patients having DCIS (About 73%) on final histopathology testing was the reason for this extremely high re-excision rate.[16]

However, in their series of 39 patients, Koppiker et al.[17] obtained clean margins in all of his patients with a median tumor diameter of 75 mm; moreover, the re-excision rate and conversion to mastectomy rate were nil.[17] These positive outcomes suggested that EOBCS was a good choice for a few individuals.

In their study, Fischer et al.[18] found that MRI reduced the rate of re-excision for positive margins, considering DCIS and ILC as predicted risk factors for obtaining positive margins and re-operation in several studies.[18] Only two instances, or 5% of the total, had DCIS in our analysis, which is too few to link to one case with a positive margin.

Our study's total problems rate was 37%, higher than previously reported rates of 16.2% to 23%.[16] This might be explained by the fact that a greater percentage of patients (82.5%) received therapeutic mammaplasty, which has a high incidence of problems among a highly diverse set of studies that indicated a risk of complications ranging from 10% to 90%. The high percentage of patients that underwent neoadjuvant therapy (77%) may also help to explain this. Nonetheless, this rate of complications is similar to all of the studies that have been published.[19] However, no patient experienced any postoperative adjuvant radiotherapy delays, and no significant complications necessitating additional surgical intervention occurred.

The relevance of EOBCS is increased by the fact that mastectomy has major negative consequences on one's sexual and psychological well-being and that psychological depression following a mastectomy might last for years after cancer treatment.[19] Only one patient (2.5%) in this research required a complete mastectomy after being offered one. Additionally, 17 instances (42.5%) had an overall patient satisfaction level of "excellent," 21 cases (52.5%) had a score of "good," and 2 cases (5%), "fair."

Limitations

Although achieving promising results with eOBCS, this study had some limitations including small sample size, near to half retrospective cases from a single institution, abscent control group, and short follow up period so independent oncologic results as regaurding local recurrence and depending only on clear margins. However, the acceptable complication rates and potential benefits regarding margin control and esthetic outcomes seen in this study support the availability of this technique in appropriate patients in low facility institutions.

Conclusion

In certain individuals with tumors larger than 50 mm or those that are multifocal or multicentric, extreme oncoplastic surgical procedures are promising choices that may result in breast conservation. Long-

term statistics on recurrence rates and survival in extended follow-up periods are necessary. However these alternatives are superior to mastectomy, reconstruction, and radiation therapy combined.

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