Original Article

Determination of Oncologic Outcomes, Satisfaction, and Psychosocial Well-being in Patients with Breast Cancer after Oncoplastic and Conventional Breast Conserving Surgery

Sedighe Tahmasebi [1], Mastoureh Mohammadipour [1], Masoumeh Ghoddusi Johari [1], Mehdi Shariat [1], Majid Akrami [1], Vahid Zangouri [1], Mohammadyasin Karami [1], Abdolrasoul Talei [1]

1. Breast diseases research center, Shiraz University of Medical sciences - Shiraz, Iran

***Corresponding Author:**

Sedighe Tahmasebi

Breast diseases research center, Shiraz University of Medical sciences, Shiraz, Iran

Email: tahmasebikh@gmail.com

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ABSTRACT

Background: Breast cancer is the most common cancer in women and surgery is necessary for its treatment. We aimed to determine the oncologic outcomes, satisfaction with breasts, and psychosocial well-being in the patients with breast cancer, after oncoplastic and conventional breast conserving surgery (BCS).

Method: The patients with breast cancer from Shahid Motahari Clinic affiliated to Shiraz University of Medical Sciences, Shiraz, Iran from December 2020 to December 2021 were allocated to two groups, one who had undergone BCS alone and the patients who had undergone oncoplastic BCS. For all the patients, demographic data, data about surgery, oncologic outcomes, wound complications, and BREAST-Q© questionnaire score were collected and compared between two groups.

Result: The mean age of the patients in the oncoplastic BCS and BCS group was 48.13±9.73 (median=48), and 50.01±8.47 (median=50) years, respectively. The mean score of psychosocial well-being was higher in the oncoplastic BCS group in comparison with BCS alone. (*P*-value< 0.0001). Also, the mean score of satisfaction with breast was higher among the oncoplastic BCS group in comparison with the BCS group (*P*-value< 0.0001).

Conclusion: Replacing traditional BCS with oncoplastic BCS does not adversely affect the oncologic results of surgery but improves the consequent psychosocial well-being and satisfaction in the patients.

Keywords: Breast cancer; Oncoplastic surgery; Breast Conserving Surgery; BREAST-Q

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INTRODUCTION

Breast cancer is the most common cancer in women [1] and surgery is an essential part of treatment. Breast cancer surgery has changed a lot over time, yet the goal of surgery is to eliminate the tumor from the breast with the least degree of deformity [2-5].

The quality of life in patients with breast cancer is damaged by several factors such as depression, feelings of decreased femininity and

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attractiveness, pain, fear of recurrence, fatigue, and changes in the body image, self-esteem, and sexuality [6-8]. Changes in women's body image are accompanied by negative psychological consequences and impaired quality of life [5, 9]. Breast cancer survivors with better body image cope better with cancer [10] and also are better physically and psychologically in their activities and relationships [5, 11-14].

Breast conserving surgery (BCS) is the most common procedure for breast cancer nowadays and aims at surgical excision of the tumor while protecting the breast appearance [11, 15]. BCS has an equivalent survival benefit compared with the conventional mastectomy [12] and simultaneously has a positive impact on quality of life and body image among young women [16].

Before prevalence of oncoplastic BCS, the deformities of conventional BCS were often severe and associated with complications and patient dissatisfaction [17]. Oncoplastic surgery extends the possibility of BCS, creates mild deformities, and reduces the rate of mastectomy and re-excision [18]. Although there are a lot of studies showing the superiority of oncoplastic surgery, further studies are required to address the body image concerns after breast cancer surgery [19].

Oncoplastic breast conserving surgery is performed using either the volume displacement technique (type 1) or volume replacement technique (type 2). This type of surgery is commonly performed in our center recently, so we aimed to determine the oncologic outcomes, satisfaction with breasts, and psychosocial well-being in our patients with breast cancer, after oncoplastic and conventional BCS.

METHODS

This study was approved by the Ethics Research Committee and included patients referred to Shahid Motahari Clinic affiliated to Shiraz University of Medical Sciences, Shiraz, Iran who had undergone breast conserving surgery (BCS) due to breast cancer from December 2020 to December 2021.

Patients who were treated at Shahid Motahari Clinic and had undergone BCS, chemotherapy completion at least in the last three months, and patients who agreed to sign the informed consent were considered for initial inclusion.

The patients were allocated to two groups, one who had undergone BCS alone and the patients who had undergone oncoplastic BCS (type 1: volume-displacement techniques).

Patients who had simple mastectomy or MRM with or without breast reconstruction (oncoplasty type 2: volume-replacement techniques), those under chemotherapeutic treatment, those with bilateral or male breast cancer, and those who developed local recurrence/distant organ metastases were excluded.

According to the pilot sampling method, 100 patients were considered for each group. After collecting the data and performing power analysis, according to the following formula, the test power based on the values of mental health variables was equal to 84%, which was acceptable.

$$n = \frac{\left(Z_{1-\alpha/2} + Z_{1-\beta}\right)^2 \left(\sigma_1^2 + \sigma_2^2\right)}{\left(\mu_1 - \mu_2\right)^2}$$

$\mu_1 = 41.94$ $\quad S_1 = 5.78$

$\mu_2 = 38.02$ $\quad S_2 = 7.21$

For all the included patients, a check-list was filled out containing demographic data (age, marital status, educational level, occupation, etc.), data about surgery (tumor size, type of surgery, symmetrization, etc.), oncologic outcomes (positive margins, need for mastectomy, recurrence (recurrence was an exclusion criteria), metastases), wound complications (infection, hematoma, seroma), and BREAST-Q© questionnaire (the module related to the breast conserving therapy).

The BREAST-Q© is a rigorously developed patient-reported outcome (PRO) measure designed to evaluate the outcomes among women who have undergone different types of breast surgery. Studies illustrate that the BREAST-Q is scalable to national and international levels and is able to achieve high response rates [20]. BREAST-Q© contains the quality of life domains such as psychosocial well-being which measures psychosocial well-being with items that ask about body image (e.g., accepting of body, feeling attractive) and a woman's confidence in social settings. Other items cover emotional health and self-esteem. BREAST-Q© also includes satisfaction domains such as satisfaction with breasts which measures the body image in terms of a woman's satisfaction with her breasts and asks questions regarding how comfortably bras fit and how satisfied a woman is with her breast area both clothed and unclothed. Postoperative items ask about breast appearance (e.g., size, symmetry,

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softness) and clothing issues (e.g., how bras fit, being able to wear fitted clothes). Since each scale functions independently, the patients can be asked to complete some or all of a module's BREAST-Q© scales (reference guide).

We used the BCT module (post-operative) for satisfaction that contains 11 questions along with breast cancer core scale (pre and post-operative) psychosocial well-being module, which comprised of 10 questions.

We used a Persian version of BREAST-Q Version 2.0© (BCT Module) in this study. Scoring and interpreting the BREAST-Q was performed based on the BREAST-Q user's guide. The internal validity of the breast reconstruction module was validated by Cronbach's alpha value of 0.94 by Eslami et al. [21]

STATISTICS

The Chi-Square and Fisher-Exact test were used for testing the significance of the difference of proportions. For determining the association between the mental health and satisfaction score with group, multivariate analyses of covariance (ANCOVA), controlling for the covariates, were conducted. Statistical analysis was performed using SPSS statistical software, version 19.0 (IBM Corp., Armonk, NY, USA) and *P*-value of less than or equal to 0.05 was defined as statistically significant.

RESULTS

The mean age of the patients in the oncoplastic BCS and BCS group was 48.13±9.73 (median=48), and 50.01±8.47 (median=50) years, respectively (*P*-value=0.076). The majority of women in both oncoplastic BCS and BCS groups were married (79.6%, 77%), had a diploma (54.5%, 30%) and were housewives (83.5%, 88%). Also, the results presented in Table 1 indicate the complications following each surgery. Presentation of wound infection (*P*-value =0.016), seroma (*P*-value<0.0001), and hematoma (*P*-value <0.0001) were statistically different in both groups.

Table 1: Demographic and Clinical Characteristics in Breast Cancer Patients in the Study

Variable		Group		*P*-value
		Oncoplastic BCS	BCS	
Marital Status	Single	15 (15.3%)	13 (13%)	.43*
	Married	78 (79.6%)	77 (77%)	
	Divorce	5 (5.1%)	10 (10%)	
Education	Illiterate	11 (11.3%)	15 (15%)	.17*
	Primary	21 (21.6%)	28 (28%)	
	High School	44 (45.5%)	30 (30%)	
	University	21 (21.6%)	27 (27%)	
Job	Housewife	81 (83.5%)	88 (88%)	.41*
	Employed	16 (16.5%)	12 (12%)	
Histology	Invasive Ductal Carcinoma	86 (91.5%)	89 (89.2%)	<.0001**
	Others	8 (8.5%)	10(10.8)	
Axillary Management	SLNB	67 (69.8%)	63 (64.9%)	.47*
	ALND	29 (30.2%)	34 (35.1%)	
Neoadjuvant Chemotherapy	No	85 (85.9%)	86 (86%)	.97*
	Yes	14 (14.1%)	14 (14%)	
Wound infection	Yes	3 (3%)	12(12%)	.016*
	No	97(97%)	88 (88%)	
Seroma	Yes	3 (3%)	22 (22%)	<.0001*
	No	97 (97%)	78 (78%)	
Hematoma	Yes	0	12 (12%)	<.0001*
	No	100(100%)	88 (88%)	
Breast edema	Yes	27 (27%)	31 (31%)	.53*
	No	73 (73%)	69 (69%)	
Positive margin	Negative	87 (89.7%)	92 (92%)	.54*
	Positive	10 (10.3%)	8 (8%)	

*: Chi-Square test, **: Fisher-Exact test, SLNB :Sentinel Lymph Node Dissection, ALND :Axillary Lymph Node Dissection

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The results of the analysis of covariance to examine the interactions between those four variables (seroma, hematoma, wound infection, and histology) with the group are presented in Table 2; according to the obtained *P*-values, none of the effects was significant. Thus, according to Figure 1 the mean score of psychosocial well-being was higher in the oncoplastic BCS group in comparison with BCS alone that was statistically significant (41.94 ± 5.78 vs. 38.02 ± 7.21) (*P*-value< 0.0001). Also, According to Figure 2, the mean score of satisfaction was higher among the oncoplastic BCS group in comparison with the BCS group (37 ± 4.85 vs. 29.03 ± 5.18) (*P*-value< 0.0001).

DISCUSSION

This study compared two groups of breast cancer patients who had undergone oncoplastic BCS or traditional BCS. Replacing traditional BCS with oncoplastic BCS does not adversely affect the oncologic results of surgery but improves the consequent mental health status and satisfaction in the patients.

The main therapies for the breast cancer are surgical resection, systemic therapy, and radiation. Currently many of the breast cancer patients have long-term survival, so the cosmetic result of the surgical treatment is important [22]. Therapies and outcome of breast cancer have improved a lot and some of the most dramatic changes occurred in the surgical management of breast cancer. BCS has become a standard treatment strategy for early-stage breast cancer. [4, 22, 23]

Conservative mastectomy was introduced by Freeman [24] in 1962 for benign breast masses. A 10-year follow-up of 1,500 patients after BCS for breast cancer or benign diseases was reported in 1989 which showed that only 0.5% of operated patients developed breast cancer recurrence [25]. It was also found useful even in high-risk females [25-27]. Further studies reported acceptable breast cancer recurrence rates after BCS which were the same as recurrence rates after modified radical mastectomy, so gradually BCS became popular for both prophylaxis and treatment of breast cancer [28]. The oncoplastic techniques of BCS minimize surgical extent and preserve cosmetic outcomes while achieving

Table 2: Results of Analysis of Covariance to Investigate the Interactions

Variables	Satisfaction			Psychosocial well-being		
	ANCOVA			ANCOVA		
	F	*P*-value	η2	F	*P*-value	η2
Group*Seroma	0.037	0.848	0.0001	0.00044	0.995	0.00002
Group*Hematoma	2.04	0.154	0.010	0.669	0.414	0.0003
Group*Wound Infection	2.602	0.102	0.013	0.425	0.515	.002
Group*Histology	0.743	0.564	0.016	1.085	0.365	0.024

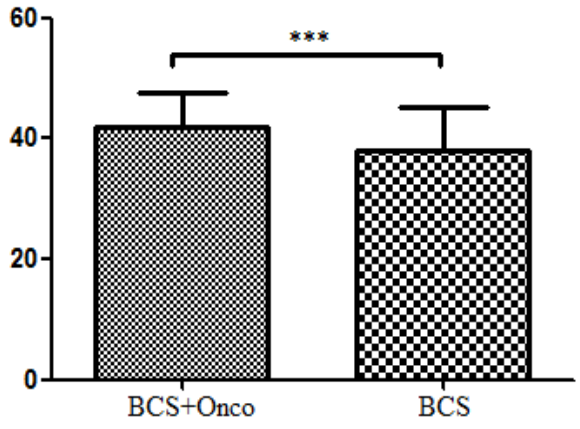

Figure 1: Psychosocial well-being between the BCS+ONCO and BCS groups

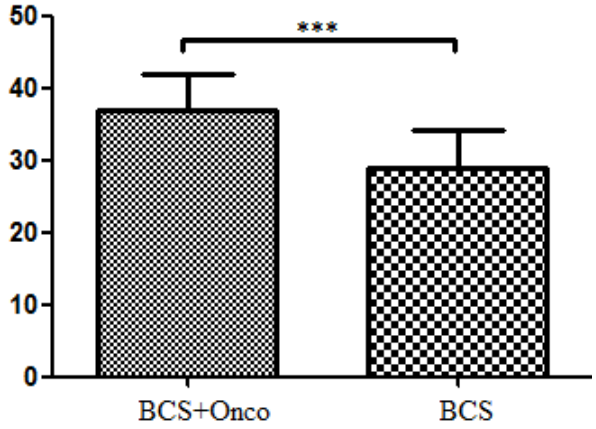

Figure 2: Satisfaction between the Oncoplastic BCS and BCS groups

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excellent oncologic outcomes.[29]

Our results demonstrates that oncoplastic breast surgery helps breast cancer patients with their body image, mental health and satisfaction, which is in the same line with other studies of this type.[30-32]

Totally, as mastectomy has been a standard treatment for breast cancer for many years, currently unacceptable techniques may become standard of care in the future [33]. Altogether, now BCS seems to be introducible as the standard surgical technique for early stage breast cancer with acceptable oncologic results and improved aesthetic and psychosocial outcomes. Moreover, oncoplastic techniques extend the possibility of BCS, minimizes deformities, and do not interfere with oncologic outcomes.

Finally, for the best surgical decision for breast cancer surgery, risks and benefits of oncoplastic BCS should be considered and the perfect decision should be personalized to each patient, taking into account individual and clinicopathological factors.

CONCLUSION

Replacement of traditional BCS with oncoplastic BCS does not adversely affect the oncologic results of surgery but improves the consequent psychosocial well-being and satisfaction in the patients.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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