

Psychological and Aesthetic Outcomes in Breast Cancer Patients

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Background: Patients who undergo breast cancer treatment require psychosocial and aesthetic rehabilitation. Advantages of breast reconstruction in-patient rehabilitation are well known. Oncoplastic organ-preserving surgery offers aesthetically better results, yet is often considered less safe than more radical procedures. We compared the aesthetic and psychological outcomes in patients undergoing breast reconstruction and oncoplastic breast cancer treatment.

Methods: In total, 1130 patients who received either breast reconstruction or oncoplastic breast cancer surgery were included in the study. Patients were classified into two groups. Group 1 included 510 patients who received breast reconstruction surgery. Group 2 included 620 patients who received oncoplastic surgery. The following aspects were compared between the two groups: demographics, tumor progression, and immunohistochemical aspects, complications, hospitalization stay, and psychological and aesthetic outcomes.

Results: Patients in the oncoplastic group showed statistically significant higher psychosocial and aesthetic outcomes, as well as lower incidence of complications, revision rate, disease progression, and recurrence. The majority of oncoplastic patients were treated in early stages of breast cancer.

Conclusion: Offering superior treatment results, oncoplastic organ-preserving surgery should be favored in patients with earlier stages of cancer progression. (*Plast Reconstr Surg Glob Open* 2021;9:e3679; doi: [10.1097/GOX.0000000000003679](https://doi.org/10.1097/GOX.0000000000003679); Published online 13 July 2021.)

INTRODUCTION

Malignant neoplasms are one of the leading causes of death and disability. In 2018 in Russia, breast cancer accounted for 20.9% of all malignant neoplasms. The absolute number of new annual cases has significantly increased over the past decade from 52,469 in 2008 to 70,682 in 2018.¹ Breast cancer treatment leaves most patients in need

of psychological and somatic rehabilitation.² Rehabilitation of cancer patients is a complex system aimed at adapting patients to life after cancer. Modern conservational surgery and advances in breast reconstruction improve the toll of the psychological burden and aesthetic defect, while providing enhanced cancer treatment capabilities.³⁻⁵

Unfortunately, oncoplastic preservation surgery is not available for all patients, and many undergo more radical procedures, including modified radical mastectomy.⁶ A modified radical mastectomy has a significant psychological burden, with notable positive effect from breast reconstruction.⁷ Therefore, breast cancer treatment today must include breast reconstruction as a component for complex patient rehabilitation.⁸

Breast reconstruction includes symmetry restoration, which often prompts the surgical correction of the contralateral breast gland. When performing breast reconstruction, the possibility for simultaneous plastic surgery of the contralateral breast depends on many treatment aspects, and plays an important role in overall patient rehabilitation.⁹ We compared different approaches in breast reconstruction surgery and their effects on patient psychosomatic rehabilitation to support the hypothesis that oncoplastic surgery is as safe and aesthetically sufficient as more radical procedures within similar cohorts.

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Received for publication December 23, 2020; accepted May 12, 2021.

Presented at the Moscow Breast Meeting (Clovermed), February 7, 2019.

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DOI: [10.1097/GOX.0000000000003679](https://doi.org/10.1097/GOX.0000000000003679)

Disclosure: *The authors have no financial interest to declare in relation to the content of this article.*

MATERIALS AND METHODS

A retrospective analysis of 1130 cases of breast cancer treatment results was conducted at P.A. Hertsen Moscow Oncology Research Center from 2013–2019. The study design and protocol were reviewed and approved by the institutional review board of our institution, which waived informed consent due to the retrospective nature of the study.

Right breast cancer was seen in 553 cases (48.94%); left breast cancer, in 577 cases (51.06%). An estimated 538 (47.6%) patients were premenopausal, and 592 patients were menopausal (52.4%). Patients classified according to immunohistochemical tumor characteristics are presented in Table 1.

The patients were separated into two groups according to treatment tactic (Table 2). Group 1 included 510 who received breast reconstruction surgery (45.13%); Group 2 included 620 patients who received oncoplastic breast surgery (54.87%). Patient treatment tactic was decided by an institutional multidisciplinary oncological council. Oncoplastic surgery included patients who received lumpectomies with breast tissue preservation via volume displacement.¹⁰ Nipple preservation oncoplastic surgery was carried out in 583 patients. All Group 2 patients underwent radiation therapy with a dose of 41.5 ± 5.6 Gy. Retrospective data regarding patient age, menopausal status, cancer stage, progression, therapy, surgery type, contralateral breast surgery, and complications were evaluated. Patients with genetic predisposition were not included in the current study.

Immunohistochemistry analysis was performed to evaluate cancer subtype. HER-2/neu assay was confirmed by fluorescent in situ hybridization analysis in all cases. All patients included in the study underwent a survey for evaluation of aesthetic results and psychological criteria. The survey “Evaluation of Cosmetic Results after Organ-preserving Operations, Oncoplastic Resections, Reconstructive Plastic Surgery in Patients with Breast Cancer” was developed at P.A. Hertsen Moscow Oncology Research Center, and the results were graded on an overall scale: excellent (5.0–4.0), good (4.0–3.0), satisfactory (3.0–2.0), and unsatisfactory (2.0–0.0).

The significances of differences between Group 1 and Group 2 were determined using the independent *t*-test or the nonparametric Mann-Whitney U-test when variables were nonnormally distributed. Complications and revision rates were compared using Pearson’s chi-squared test or Fisher’s exact test. The analysis was conducted using IBM SPSS Statistics for Windows, version 19.0 (IBM Corp.,

Armonk, N.Y.). Results are presented as means ± SD or as numbers and percentages, and statistical significance was set at a *P* value less than 0.05.

RESULTS

Study results are presented in Table 2. Patient demographic characteristics and mean follow-up time did not have any negative impact on study outcomes, as there were no significant differences between the two groups. Group 1 had significantly more patients in premenopausal state (*P* < 0.001). Patients in Group 2 had more postmenopausal patients with hormone-dependent cancers.

In regard to immunohistochemical characteristics of cancer type, Group 1 had less Luminal A, Luminal B HER-2/neu negative (*P* < 0.001), and Luminal B HER-2/neu positive subtypes. Patients in Group 1 had generally later-stage cancers. Group 2 patients predominantly had early stage cancer (*P* < 0.001), which accounted for treatment tactic. Cancer progression was significantly higher in Group 1 patients (*P* < 0.001).

The overall complication rate was higher in Group 1 (*P* < 0.001), significantly burdened by implant-related complications, which account for over 50% of all complications in that group. Surgical revision rate was significantly greater in Group 1.

Aesthetic result, evaluated via surveying, was significantly better in Group 2, as well as the psychosocial impact (*P* < 0.001). The psychological setbacks in patients in Group 1 were significantly greater, with average grade being just above satisfactory.

DISCUSSION

The psychological impact of breast reconstruction on patient quality of life has been previously assessed; many such studies have shown significant advantages of breast reconstruction.^{11–13} Oncoplastic breast conserving surgery has also shown significant advantages in aesthetic and psychosocial patient well-being after cancer treatment.^{14,15} We have offered a comparison of aesthetic outcome and psychosocial well-being in patients undergoing mastectomy with reconstruction and patients who receive oncoplastic surgery. The results show significant advantages of oncoplastic surgery, with lower recurrence and progression rates, as well as improved aesthetic and psychosocial recovery, lower complication rate, reduced overall risk of perioperative complications, and shorter hospitalization stay.

Important considerations can be made from the results of our study. Because minimally invasive procedures offer better aesthetic outcomes, high-risk patients with early or undetected cancer, genetic predisposition, and complicated family history may benefit from early treatment. Patients with genetic predisposition and Stage 0 cancer may be offered a prophylactic mastectomy in cases of high risk of breast cancer, as this offers for a more tissue sparing approach, with retention of axillary regional anatomy and of the cutaneous pocket. Due to the nature of our evaluation, such patients were not included in the study, yet present an important cohort with special considerations in terms of treatment efficacy and aesthetic results.

Table 1. Immunohistochemical Characteristics of Patient Pathology

Immunohistochemical Tumor Type	No. Cases	%
Luminal type A	558	44.64
Luminal type B, Her-2/neu- negative	168	13.44
Luminal type B B, Her-2/neu- positive	321	25.68
HER-2/neu-positive	68	5.44
Triple negative	135	10.8
Total	1250	100

Table 2. Overall Study Characteristics and Results

Overall No. Cases	Group 1	Group 2	P
	Simultaneous Breast Reconstruction	Oncoplastic Resection	
	510	620	
Age, y (mean)	44 ± 8.48	54.3 ± 10.2	0.438
Follow-up, mo (mean)	49.2 ± 8.3	44.5 ± 12.3	0.751
Premenopausal	349 (68.43%)	189 (30.48%)	<0.001*
Postmenopausal	161 (31.57%)	431 (69.52%)	<0.001*
Stage 0	25 (4.90%)	26 (4.19%)	0.569
Stage I	156 (30.59%)	330 (53.23%)	<0.001*
Stage IIA	146 (28.63%)	172 (27.74%)	0.742
Stage IIB	75 (14.70%)	37 (5.97%)	<0.001*
Stage IIIA	69 (13.53%)	31 (5.00%)	<0.001*
Stage IIIB	21 (4.12%)	21 (3.39%)	0.519
Stage IIIC	17 (3.33%)	3 (0.48%)	<0.001*
Stage IV	1 (0.019%)	0 (0.00%)	0.270
Neoadjuvant chemotherapy	122 (23.92%)	39 (6.29%)	<0.001*
Luminal A	199 (39.02%)	307 (49.52%)	<0.001*
Luminal B, HER-2/neu positive	75 (14.71%)	77 (12.42%)	0.263
Luminal B, HER-2/neu negative	102 (2.00%)	178 (28.7%)	<0.001*
Nonluminal	42 (8.24%)	23 (3.7%)	0.002*
Triple negative	87 (17.06%)	34 (5.48%)	<0.001*
Hospitalization stay (days, mean)	12.79 ± 7.32	10.32 ± 4.77	0.777
Expander-implant reconstruction (n)	236 (46.27%)	N/A	N/A
Direct to implant reconstruction (n)	212 (41.57%)		
DIEP flap (n)	12 (23.53%)		
TRAM flap (n)	34 (66.67%)		
Thoracodorsal flap with implant (n)	16 (31.37%)		
Contralateral mammoplasty (n)	66 (12.94%)	98 (15.81%)	0.244
Lipofilling (n)	41 (8.04%)	6 (0.97%)	<0.001*
Seroma	31 (6.08%)	7 (1.13%)	<0.001*
Skin necrosis	18 (3.53%)	2 (3.23%)	<0.001*
Suture dehiscence	21 (4.12%)	8 (1.30%)	0.003*
Infection	7 (1.37%)	0 (0.00%)	0.004*
Implant-related complications	96 (18.82%)	N/A	N/A
Surgical revision rate	48 (9.41%)	6 (0.97%)	<0.001*
Cancer recurrence	10 (1.96%)	7 (1.13%)	0.254
Cancer progression	21 (4.12%)	9 (1.45%)	0.006*
Aesthetic result (grade)	4.2 ± 0.04	4.8 ± 0.05	<0.001*
Psychosocial impact (grade)	3.3 ± 0.04	4.6 ± 0.06	<0.001*

*Statistically significant at $P < 0.05$.

Our results show specific similarities with large cohort evaluations performed in North American centers.^{16–23} Our study is the first such study performed in the Russian Federation, and is unique due to the region of origin. Specific differences between results seen in previous publications concerning aesthetic and psychological outcomes in oncoplastic patients can be attributed to healthcare and social peculiarities. The use of standardized PROM tools, such as BREAST-Q, is currently limited in Russia due to local guidelines restricting researchers to develop locally adapted patient surveys.

The drawbacks of this retrospective evaluation include significant differences between groups in regard to tumor progression. Despite this, we believe that this fact actually underlines the importance of consideration for oncoplastic surgery of patients in early stages of breast cancer. Therefore, oncoplastic preservation surgery should be favored over complex breast reconstruction for patients in earlier stages of tumor progression. Another limitation of our study is the use of unvalidated questionnaires. We relied on our own institutional questionnaires to better reflect specific points requiring evaluation for this study. Nonetheless, this imposes certain limitations in direct comparison between previous studies, similar to ours.

Reconstructive plastic surgery plays an important role in the surgical rehabilitation of patients with breast cancer, and it provides good aesthetic and psychological

rehabilitation after breast cancer treatment. Organ-preserving oncoplastic surgery contributes to significantly better aesthetic and psychological results. Both methods provide restoration of the natural form of the breast, contribute to improving and accelerating the rehabilitation of patients with breast cancer due to the timely return of patients to active social activities, preventing psychological stress, reducing the incidence of disability. Careful consideration should be taken to selection of patients for these procedures. In treatment of earlier stages of breast cancer, preference should be given to oncoplastic organ-preserving surgery. Breast reconstruction surgery has a wider range of patient eligibility and is favorable at later stages and in delayed treatment.

CONCLUSIONS

Minimally invasive, carefully planned oncoplastic breast cancer treatment yields significantly better results than complex breast reconstruction, and should therefore be favored. Careful patient selection, treatment harmonization, full-body diagnostic procedures, and sentinel lymph node biopsy help expand the range of eligible patients for oncoplastic breast surgery. Breast reconstruction surgery remains an important surgical procedure for patient rehabilitation, and should be considered for patients who undergo more radical surgical procedures.

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