

The Quality of Life Measurements Following Oncoplastic Breast-conserving Surgery

Meme Koruyucu Onkoplastik Cerrahi Sonrası Yaşam Kalitesinin Ölçümü

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Abstract

Objective: Oncoplastic breast-conserving surgery (OBSC) is a widely accepted surgical option among breast cancer patients. We aimed to evaluate the histopathological findings of breast tumors and quality of life scores.

Method: The clinical and pathological data of 49 female patients who underwent OBSC in University of Health Sciences Turkey, İstanbul Bağcılar Training and Research Hospital between January 2015 and January 2019 for breast cancer were retrospectively evaluated. According to the location of the tumor, the racket method or J-mammoplasty techniques was selected. Quality of life and patient satisfaction assessment questionnaire was performed.

Results: The mean age was 48.1 (26-68) years. The most common incision pattern was the racket pattern (85%). The invasive ductal carcinoma (89.8%) was seen more than ductal carcinoma *in situ* (6.1%) and papillary carcinoma (4.1%). The distance to the surgical margin was approximately 7.1 mm (1-20). The estrogen receptor positivity was 74.2% (5-100%) and progesterone receptor positivity was 61.8% (5-98%). 61.2% received chemotherapy (100%, radiotherapy). Based on questionnaires, the score of quality of life and satisfaction was 34 (25-47). Especially, the body image function [22 (15-29)] and health functions [10 (7-13)], such as breast & arm symptoms, were better in the patients who had higher scores ($p<0.001$).

Conclusion: The histopathological patterns of the patients following OBSC potentially did not show any impact among the quality of life and satisfaction scores.

Keywords: Breast cancer, breast-conserving surgery, quality of life

Öz

Amaç: Meme koruyucu onkoplastik cerrahi (MKOC), onkolojik ve cerrahi alanda yaygın olduğu kadar meme kanseri hastaları arasında da oldukça fazla kabul görmektedir. Bu çalışmada, MKOC uygulanan hastaların meme tümörlerinin histopatolojik sonuçlarını ve yaşam kalitesi skorlarını değerlendirmeyi amaçladık.

Yöntem: Sağlık Bilimleri Üniversitesi, İstanbul Bağcılar Eğitim ve Araştırma Hastanesi'nde Ocak 2015 - Ocak 2019 tarihleri arasında meme kanseri nedeniyle MKOC uygulanan 49 kadın hastanın klinik ve patolojik verileri retrospektif olarak incelendi. Tümörün lokalizasyonuna göre, insizyon paternleri olarak raket yöntemi veya J-mamoplasti kullanılmıştır. Hastalara yaşam kalitesi ve hasta memnuniyeti değerlendirme anketi yapıldı.

Bulgular: Hastaların yaş ortalaması 48,1 (26-68) yıl idi. En yaygın insizyon paterni raket paterniydi (%85). En sık görülen histopatolojik bulgu invaziv duktal karsinom (%89,8), en az görülenler ise *in situ* duktal karsinom (%6,1) ve papiller karsinom (%4,1). Tümörlerin cerrahi sınıra uzaklığı yaklaşık 7,1 mm (1-20) idi. Östrojen reseptörü pozitifliği ortalama %74,2 (%5-%100) ve progesteron reseptörü pozitifliği ortalama %61,8 (%5-%98) idi. Hastaların % 61,2'si kemoterapi, %100 radyoterapi aldı. Anket sonuçlarına göre, ortalama yaşam kalitesi ve memnuniyet skoru ortalaması 34 (25-47) idi. Hayat kalite skoru daha iyi olan hastalarda, özellikle vücut imajı fonksiyonu [22 (16-29)] ve meme ve kol semptomları gibi sağlık fonksiyonları [10 (7-13)] daha iyi idi ($p<0,001$).

Sonuç: MKOC yapılan hastaların histopatolojik paternlerinin, yaşam kalitesini ve memnuniyetini önemli ölçüde etkilemediğini göstermektedir.

Anahtar kelimeler: Meme kanseri, meme koruyucu cerrahi, yaşam kalitesi



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Introduction

Today, breast cancer is the most common malignant tumor among women. 18% of cancer-related deaths in women occur due to breast cancer, and an increase in the frequency of breast cancer is expected in the next 10 years (1). Depending on the importance of the female breast in today's society, the anatomical location of breast cancer is a highly emotional issue. Therefore, it is imperative for the surgeon performing breast surgery to have a basic understanding of which patients are candidates for breast reconstruction and what reconstructive options are. Whether autogenous tissue or breast implant will be used, the location of the scar, and how long the healing will take are the questions that need to be answered. Besides, the emotional, physical, and oncological needs of the patient must be met before and after a breast surgery (2,3).

Oncoplastic breast-conserving surgery (OBCS) is a widely accepted operation in the oncological and surgical field as well as among breast cancer patients (1,2). OBCS is an innovative therapeutic option for patients with an early stage of breast cancer; however, it is characterized by special approaches to tumor resection following a breast reconstruction (3,4). The main purpose of OBCS is to maintain or potentially improve a patient's quality of life, including long-term survival while providing a good breast appearance (1,5,6). Deformations and unsatisfactory cosmetic results following breast cancer surgeries have contributed to the increasing popularity of OBCS (7). Cosmetic and functional results of the surgery are highly related to the quality of life, while the poor aesthetic results are associated with psychosocial distress and a poor quality of life (8). To the best of our knowledge, the relationship between the histopathological findings of breast tumors and the quality of life of patients has not been studied before. In this retrospective study, we aimed to reveal the relationship between the histopathological results of breast tumors and the quality of life scores of the patients undergoing OBCS.

Materials and Methods

After obtaining the approval of our hospital's ethics committee for the study, clinical and pathological data of 49 female patients who underwent OBCS due to breast cancer between January 2015 and January 2019 at University of Health Sciences Turkey, İstanbul Bağcilar Training and Research Hospital were retrospectively analyzed. All patients underwent preoperative radiological imaging. Depending on the localization of the tumor, one

of the techniques, namely the tennis racket method, or J-mammoplasty, was selected as an incision pattern of tumors. If the tumor to be excised was located on the upper quadrant of the breast, racket method was selected. Besides the histopathological data of the patients, the numbers of those who received chemotherapy or radiotherapy, and who imaged by positron emission tomography, magnetic resonance imaging, computed tomography, mammography, or ultrasonography were recorded. The Turkish version of quality of life and patient satisfaction assessment questionnaire (EORTC QLQ-BR23) was performed to the patients after the surgery, and the results were evaluated in three groups on a scale of 1-4, and then the scores were correlated with the histopathological findings reported. The quality of life score was dichotomized based on data review (less than 34.42 or greater than 34.42). QLQ-BR23 scores were measured as physical function [body image function, sexual function and health function (breast & arm symptoms)] (9,10).

Statistical Analysis

Descriptive statistics were reported as percentages for categorical variables and as mean with standard deviation for continuous variables. The analysis comparing clinical covariates and quality of life scores were performed using chi-square test for categorical variables and t-test for parametric continuous variables. The Mann-Whitney U test was used for the variables that did not execute the normal distribution assumption. Parametric variables were correlated with the Pearson correlation test, and non-parametric variables were correlated with the Spearman correlation test. Significance was accepted at the level of $p < 0.05$. All analyses were completed by R software version 3.4.2.

Results

The mean age of the patients was 48.1 (26-68) (minimum-maximum) years (Table 1). The post-surgical follow-up period was 21.9 (8-35) months. While a segmental mastectomy was performed in all patients, an axillary dissection was performed in 22 patients (44.9%). The most common incision pattern was the tennis racket (93.8%). The most common histopathological cancer type was invasive ductal carcinoma (IDC) observed in 44 patients (91.8%), the least types were ductal carcinoma *in situ* in 3 patients (6.1%) and papillary carcinoma in 2 patients (4.1%). The most frequent location of the tumor was the upper outer quadrant detected in 65.3% of patients (n=32). 12.2% (n=6) of the other patients had a tumor localized in

Table 1. Demographic and pathological findings of patients

	(n=49)
Age (minimum-maximum)	48.1 (26-68)
Operation	n (%)
The tennis racket method	46 (93.8%)
J-mammoplasty	3 (6.2%)
Surgery type	
SM+SLNB	27 (55.1%)
SM+AD	22 (44.9%)
Histological type	
DCIS	3 (6.1%)
IDC	44 (89.8%)
Papillary CA	2 (4.1%)
Number of metastatic lymph nodes	
0	36 (73.5%)
1-10	12 (24.5%)
>10	1 (2%)
T stage	
T1	36 (73.5%)
T2	13 (26.5%)
N stage	
N0	34 (69.4%)
N1	11 (22.4%)
N2	3 (6.1%)
N3	1 (2.1%)
M stage	
M0	49 (100%)
Tumor localization	
Upper outer quadrant (superior lateral)	32 (65.2%)
Upper inner quadrant (superior medial)	4 (8.2%)
Lower outer quadrant (inferior lateral)	2 (4.1%)
Lower inner quadrant (inferior medial)	5 (10.2%)
Retro areolar quadrant	6 (12.3%)
Grade	
1	11 (22.5%)
2	28 (57.1%)
3	10 (20.4%)
ER positivity (n=37)	74.2±25.6
(X ± SD)	
PR positivity (n=33)	61.8±28.0
(X ± SD)	
CERBB-2 positivity	
0	17 (34.6%)
+1	7 (14.2%)
+2	9 (18.3%)
+3	16 (32.6%)

Table 1. Continued

	(n=49)
Distance to surgical margin (X ± SD), (mm)	7.1±4.9
Chemotherapy rate N (%)	30 (61.2%)
Radiotherapy rate N (%)	49 (100%)
Quality of life score (minimum-maximum)	34 (25-47)
Physical function	20 (15-29)
Sexual function	5 (3-9)
Health function	9 (7-13)

X ± SD: Mean ± Standard deviation, SM + AD: Segmental mastectomy + axillary dissection, SM+SLNB: Segmental mastectomy+sentinel lymph node biopsy, DCIS: Ductal carcinoma *in situ*, IDC: Invasive ductal carcinoma, CI: Confidence of interval, LN: Lymph node, ER: Estrogen receptor, PR: Progesterone receptor, Normally distributed data were recorded as mean ± standard deviation

the retro areolar quadrant, 10.2% (n=5) had a tumor in the lower inner quadrant, 8.2% (n=4) had in the upper inner quadrant, and 4.1% (n=2) had in the lower outer quadrant. No significant relationship was found between the histological types and tumor locations (p=0.125). However, the most common type, namely IDC, was detected in the upper outer quadrant.

The most common tumor grade was diagnosed in grade 2 (57.1%) and others were grade 1 (22.5%) and grade 3 (20.4%). Pathologically, the mean of CERBB-2 positivity was 2.3 (range: 1-3) among 32 patients (65.3%). The mean of estrogen receptor positivity was 74.2±25.6% among 37 patients, and progesterone receptor positivity was 61.8±28.0% among 33 patients. The mean distance of tumors to the surgical margin was 7.1±4.9 mm. 61.2% of the patients received chemotherapy and 100% received radiotherapy.

According to the results of the questionnaire, the mean quality of life and satisfaction score was 34 (25-47) among all patients, without any potential effect of the histological type of the tumor (p=0.513) (Table 1, 2). The physical functions [18.00 (16-27) vs. 22.00 (15-29), p<0.001] and health functions [8 (7-13) vs. 10 (7-13), p<0.001] were better in our patients with higher scores (Table 2). The findings of quality of life scores based on clinical and pathological parameters did not show any differences between the Tennis Racket and J-mammoplasty [35 (25-47) vs. 35 (26-42), p=0.716, and Segmental Mastectomy+Sentinel lymph node biopsy and Segmental Mastectomy+Axillary dissection [34 (25-47) vs. 36 (33-42), p=0.426], (Table 3). We did not report any significant correlation between the demographical and pathological variables with the quality of life scores of patients (p>0.05) (Table 4).

Table 2. Comparison of quality of life scores based on clinical parameters

	Quality of life score (n=25) (<34.42)	Quality of life score (n=24) (≥34.42)	p
Age (X ± SD)	49.00±8.63	47.21±10.05	0.506
Operation (J-mammoplasty) (%)	2 (8.0)	1 (4.2)	1
Surgery (SM+AD) (%)	11 (44.0)	11 (45.8)	1
Histopathology (%)	-	-	0.513
DCIS	2 (8.0)	1 (4.2)	-
IDC	22 (88.0)	23 (95.8)	-
Papillary carcinoma	1 (4.0)	0 (0.0)	-
Stage (%)			
1	14 (56.0)	15 (62.5)	0.475
2	11 (44.0)	8 (33.3)	-
3	0 (0.0)	1 (4.2)	-
Grade (%)			0.549
1	7 (28.0)	4 (16.7)	-
2	14 (56.0)	14 (58.3)	-
3	4 (16.0)	6 (25.0)	-
Quality of life score median (min-max)			
Physical function	18.00 (16-27)	22.04 (15-29)	<0.001*
Sexual function	4.96 (3-6)	5.17 (3-9)	0.623
Health function	8.64 (7-13)	10.17 (7-13)	<0.001*

X ± SD: Mean ± Standard deviation, *p<0.05 vs other groups. Normally distributed data were recorded as mean ± SD, SM+AD: Segmental mastectomy+axillary dissection, DCIS: Ductal carcinoma *in situ*, IDC: Invasive ductal carcinoma

Table 3. Results of quality of life scores based on clinical and pathological parameters

	Quality of life score median (min-max)	p
Surgery	-	0.716
The tennis racket method (n=27)	35 (25-47)	-
J-mammoplasty (n=22)	34 (26-42)	-
Operation	-	0.426
SM+SLNB (n=46)	34 (25-47)	-
SM+AD (n=3)	36 (33-42)	-
Grade	-	0.864
G 1 (n=11)	33 (27-36)	-
G 2 (n=28)	34 (25-47)	-
G 3 (n=10)	35 (33-42)	-
T stage		
T 1 (n=37)	34 (26-47)	0.270
T 2 (n=12)	33 (25-43)	-
Chemotherapy	-	0.639
Yes (30)	34 (26-47)	-
No (19)	35 (25-43)	-

SM+SLNB: Segmental mastectomy+sentinel lymph node biopsy, SM+AD: Segmental mastectomy+axillary dissection, *p<0.05 vs other groups

Discussion

Breast cancer is the most common malignant tumor among women in the world and accounts for about 30% of cancers in women. In our country, it is reported that 24.1% of all cancers are breast cancer (11). Breast cancer is one of the cancer types with the best lifespan since its 5-year survival rate is 75% after diagnosis. Despite early diagnosis and treatment, cancers are critical diseases that can significantly change the quality of life of women (12,13). In breast cancer cases, the life span is prolonged due to an early diagnosis and treatment, and therefore, the concept of quality of life gains prominence.

The vast majority of cancers can be treated by early diagnosis and application of several treatment methods, hence the patient's life span can be extended. Among treatment options which are chemotherapy, radiotherapy, surgery, and hormone therapy, one or more of these methods are utilized in the treatment depending on the individual characteristics and disease status of patients diagnosed with cancer. Cancer treatment aims to treat the disease, prolong life, and reduce the symptoms and thus to improve the quality of life (11-13). That is our main goal in our clinic to enlighten the palliative care such as psychological support before and after the surgery to improve the quality of life even it was our weakness that we did not have the base measurements for each time of follow-up.

Due to cancer, the surgical removal of the breast, which is an extremely important organ for a woman since being one of the prominent symbols of femininity and sexuality in the female body, poses a threat to the feelings of sexuality, motherhood, attraction, and body image (14). For this reason, patients have to cope with the feelings of breast

Table 4. The correlation matrix of demographic and pathological variables with the quality of life scores of patients (n=49)

	Quality of life score		
	Pearson r	95% CI	p
Age	0.017	-0.266-0.297	0.910
Surgery type	-0.121	-0.389-0.166	0.406
Stage	-0.204	-0.461-0.086	0.165
T	-0.169	-0.432-0.121	0.252
N	-0.101	-0.375-0.188	0.493
Tumor localization	0.085	-0.202-0.358	0.561
Grade	0.070	-0.215-0.345	0.631
Distance to surgical margin	0.084	-0.215-0.368	0.584
Chemotherapy rate	0.011	-0.274-0.295	0.939

CI: Confidence interval, *p<0.05

loss as well as the diagnosis of life-threatening cancer (15). As we can understand that mastectomy has a negative impact on the psychology of patients comparing to breast conserving surgery which oncoplastic surgery is beneficial regarding the clinical and pathological results, consistent with our findings.

Breast loss following a mastectomy has significant effects on mental health and sexual life (16). In a study by Sertöz et al. (17), in 125 women living with breast cancer for an average of 1.5 years, a total mastectomy has been reported to impair the body perception resulting in the sexual problems. Moreover, Soygür et al. (18) reported that 72.9% of breast cancer patients had an adjustment disorder and 27.1% had a major depression. Based on those different findings in the literature, it was similarly seen in our study that the quality of life outcomes was greater in breast conserving surgery regarding the clinical and pathological characteristics (19). Also, it has been shown in many studies that the mastectomy surgery disrupts the body perception, resulting in a decrease in sexual satisfaction and spouse adjustment (20,21). Therefore, a decrease in the quality of life of patients undergoing a mastectomy is an inevitable result. In our study, we compared the histopathological results of breast tumors and the quality of life scores of patients undergoing OBSC. However, we reported that the quality of life and satisfaction assessment was not affected apparently following OBSC regardless of the stage of the disease and the histopathological type. Also, we did not observe any differences among the physical and health functions of the quality of life scores regarding the surgical or operational approaches which was consistent with the literature (22). Larger and multicenter prospective studies are needed to fully reveal the relationship between other histopathological findings of breast tumors and quality of life scores in patients undergoing an OBSC.

Opinions about which patients will receive breast reconstruction are as variable as the surgeons who perform the procedure. Principally, young patients with an early-stage disease without any comorbidity are the best candidates for the reconstruction, and therefore, unfortunately, older patients with severe breast cancer are the worse candidates. Due to a large number of different reconstructive options available today, all patients should first be offered at least these options (23). Especially, our patients' depression, anxiety and psychological unmet needs are seriously considered and followed in our daily

clinical practice, which is consistent with the previous studies in our country (24).

Consistent with the literature regarding the breast cancer treatment, our measurements were similar to the findings of some base EORTC QLQ-BR23 results of the control group of the trial for a postsurgical lymphedema during follow-up period (25). The various post-operative studies regarding the OBCS are related to a better quality of life, better physical and psychological well-being, improved social and emotional functioning, higher self-esteem and stable body image which were observed in our small population, even in the post-operative follow-up period, and the other sexual or psychological questionnaires were different (26). Consistently, as we reported that physical functions [18.00 (16-27) vs. 22.00 (15-29), $p<0.001$] and health functions [8(7-13) vs. 10 (7-13), $p<0.001$] were better in our patients with higher clinical scores following surgery.

Study Limitations

The limitations in our study are that a small sample size of patients has been analyzed retrospectively from the data of a single center and single breast surgery group in a restricted region. Considering the preliminary results, it was observed that the patients who underwent oncoplastic surgery were not affected by the decrease in the quality of life depending on the histological type of cancer, suggesting the importance of providing more social and psychological support to these patients in the clinic before and after the oncoplastic surgeries.

Conclusion

Consequently, we reported that the histopathological patterns of the patients following OBSC potentially did not show any impact among the quality of life and satisfaction scores. Moreover, the possible complications of surgical trauma and prolonged recovery period obligate full evaluation of all patients, both physically and psychologically, following the reconstruction. For this reason, social and psychological support during the surgical interventions gains importance in the clinic. Thus, it is warranted to conduct prospective randomized national or international studies with a larger number of patients to investigate new clinical aspects to measure socio-demographic characteristics.

Ethics

Ethics Committee Approval: A non-interventional ethical approval was obtained from University of Health Sciences Turkey, İstanbul Bağcilar Training and Research

Hospital Ethical Committee (date: 27.12.2019 number: 2019.12.2.02.092).

Informed Consent: Patient consent could not be obtained because it was a retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: Y.A., M.T., A.A., A.Ç., Design: Y.A., M.T., A.A., A.Ç., Data Collection or Processing: Y.A., N.A.H., T.V., G.E., A.A., Analysis or Interpretation: Y.A., N.A.H., M.T., H.Y., Writing: Y.A., A.A., M.T.

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