Evaluation of Cosmetic Outcomes of the Bilateral Reduction Mammoplasty Following the Breast Conserving Surgery and Unilateral Radiotherapy in Patients With Breast Cancer

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Abstract- Breast asymmetry and deformity are some of the consequences of unilateral breast-conserving surgery in patients with breast cancer, which is also associated with adverse psychological effects. The treatment protocol for these patients may include radiation therapy and surgical procedures, which can affect the cosmetic results in the breast. In this study, 20 patients with breast cancer who underwent reduction mammoplasty surgery after tumor removal were studied. Depending on the location and size of the tumor, it was removed with appropriate margins, and mammoplasty was performed for all patients. After surgery, the patients were referred to a radiotherapist for adjuvant treatment. The breast in which the tumor was located received radiotherapy (case), and the healthy breast was left without adjuvant treatment (control). We evaluated the cosmetic results in these patients 6 months after radiotherapy. The mean age and BMI of the patients were 46.45 years and 26.42 kg/m2, respectively. Thirteen patients were reported to have no comorbidities (65%), and four patients had diabetes (20%). Two of them had hypertension (10%), and one of them had diabetes and hypertension (10%). In seven patients, the tumor was located in the left breast, and the rest in the right. None of these parameters was significantly associated with the cosmetic results of the surgery. Surgical complications were reported in three patients with erythema (15%), in one patient with infection (5%), and in none of the patients without complications (0%). There was no significant difference in the scar score between the control and case groups. Given the negligible association between quantitative cosmetic outcomes in case and control breasts and the similar mammoplasty procedure with the same removal volume on both sides, it seems that different tissue weights need not be removed to achieve symmetry. The Vancouver Scar Score for the case and control sides showed a reduction in scar formation with radiotherapy. However, since the therapeutic dose of radiation is associated with systemic and local complications (erythema, infection, etc.), prophylactic local radiotherapy and brachytherapy could be considered in a risk-benefit study.

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Introduction

During the treatment period, the lives of patients with breast cancer are affected both emotionally and physically. In patients with breast cancer diagnosed in the early stages, unilateral breast-conserving surgery, reconstructive surgery is necessary to restore symmetry to the breasts and correct the deformity caused by tumor

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removal. Reconstructive surgery can be performed before or after the start of radiotherapy (1). According to studies conducted so far, the results of reconstructive surgery depend on the location and nature of the tumor, the size and anatomy of the breast, and the general health and lifestyle habits of the patients, in addition to the experience of the surgeon (2).

In addition to breast conservation, oncoplastic reduction mammoplasty has other benefits, including removing more tumor margins at the tumor site, reducing breast weight to enhance the effect of radiotherapy, and improving neuromuscular symptoms of the breast (3). On the other hand, some studies suggest that reduction mammoplasty in breasts undergoing radiotherapy may increase the recovery period (4).

In many studies, the beneficial cosmetic effects of reduction mammoplasty have been reported following unilateral breast conservation surgery (BCS) and before the start of radiotherapy. In a study by Newman *et al*., which included 28 patients over 23 months, no local recurrence was observed at the site of tumor resection (5). Also, starting radiotherapy after reduction surgery, except for a mild erythema, had no adverse effect on these patients.

Smith *et al*., studied 10 patients who underwent bilateral reduction mammoplasty followed by BCS (6). BCS was performed on all patients before radiotherapy, and no local recurrence occurred during a 37-month follow-up period. Only one case of fat necrosis was reported following radiotherapy.

In another study of 11 patients who underwent reduction mammoplasty, no local recurrence was reported after 24 months (7). All patients underwent radiotherapy followed by BCS, and the results included one patient with hematoma, one patient with keloid, one case of radiotherapy-induced burn, two patients with nipple discoloration, and three patients with fat necrosis. The mean cosmetic satisfaction score in these patients was 3.3 on a scale of 1 to 4.

A study by Clough et al. of 20 patients reported 2 local recurrences over 4 years, and survival rates were similar to those with other treatments (8). Cosmetic outcomes were good in 75% of patients who underwent BCS before radiotherapy and very good in 91%. No other complications were reported, except for one local recurrence and four metastases.

In general, radiotherapy may cause skin discoloration, itching, scarring, edema, and chest and breast pain. To date, there have been limited studies evaluating the effects of radiotherapy on the cosmetic outcomes of reduction mammoplasty. In most of these studies, radiotherapy following minimally invasive mammoplasty surgery had no significant effect on cosmetic outcomes, except for minor burns, shrinkage of the nipple-areola complex (NAC), inflammation and redness of the site, and scarring (4,7-9).

Considering the increase in breast cancer symptoms in recent decades in Iran (9) and the psychological consequences of this disease in patients, the need to use surgical knowledge as a complementary cosmetic treatment is felt.

Reduction mammoplasty, given that it is possible to create an appropriate negative margin in the cancerous breast and also the aesthetic effect in both breasts, can have desirable oncological and aesthetic results at the same time. The breasts become symmetrical in one session.

Psychology will also be important for the patient. Given the need for radiotherapy after surgery on the affected side, it is useful to evaluate outcomes to achieve better results and greater symmetry with the opposite side, and, as a result, greater patient satisfaction.

In this study, an attempt was made to analyze and compare data from reduction mammoplasty surgery in patients who underwent unilateral BCS, and then to examine the results of both sides to identify a significant relationship between the variables and the effect of radiotherapy on scar formation. Postoperative complications were compared between breast cancer (case) and the opposite side (control). This is a cohort study and was conducted after receiving ethics approval under the approval ID IR_TUMS_MEDICINE_REC_1398.271 on 29/06/2019.

Materials and Methods

Patients who are referred to Sina Hospital in Tehran with a diagnosis of unilateral breast cancer and are candidates for unilateral breast-conserving surgery due to the size of the breast and tumor are selected. Before the operation, the patient's consent for breast-conserving surgery and reduction mammoplasty to create symmetry between the two breasts is obtained. Preoperative photography is performed. Initial measures are taken to stage the breast cancer, and the mass is removed with adequate margins during BCS. By maintaining an appropriate vascular base according to the tumor location in the same session, the patient underwent reduction mammoplasty surgery with a similar vascular base for both sides. In the absence of complications, patients are discharged from the hospital 1 day after

surgery. When the discharge rate falls below 30 cc per day, the drain is removed. Patients are referred for adjuvant breast chemotherapy and unilateral radiotherapy. Postoperative follow-up will be performed at 1 week, 1 month, and 6 months after surgery, and up to 6 months after radiotherapy. At the 6-month follow-up visit, postoperative photographs were taken from the front and side views of both sides. Quantitative criteria (breast elevation and upper bridge, lower bridge location, nipple location, lower bridge length and width, upper and lower bridge area, and total breast area, upper and lower breast parenchyma ratio) were determined based on imaging in each breast. The cosmetic outcome was then assessed based on quantitative criteria. Cosmetic outcomes, complications, and scars were assessed based on age, body mass index, type of complex nipple-vascular base, BCS technique, comorbidities, and patient satisfaction, as measured by the Breast Reconstruction Module-QTM.

Cosmetic outcomes, scarring, and complication rates were defined in breast cancer (case group-radiotherapy) and compared with breast cancer-free (control group-no radiotherapy). Inclusion criteria were breast-conserving surgery candidates based on tumor size and location, patient consent to study, follow-up, and suitability for reduction mammoplasty with a Wise or vertical pattern.

Exclusion criteria were small breast tumors and/or large tumors that made the patient ineligible for breast reduction surgery, positive margins on pathology report, need for mastectomy, and patient dissatisfaction with the study or continued adjuvant treatment.

Data were analyzed using SPSS (version 22).

Results

The results of postoperative studies in patients within six months after radiotherapy were evaluated and analyzed as follows:

1. **Age:** The mean age of patients was 46.45 years. The oldest and youngest patients was 64 and 31 years old, respectively.
2. **BMI:** The highest BMI was 37.7 Kg/m2 and the lowest was 21.1 Kg/m2. The mean BMI of patients in this study was 26.4295 Kg/m2.
3. **Comorbidity:** In this study, 13 patients were found to be without comorbidity (65%), 4 patients with diabetes (20%), 2 patients with hypertension (10%), and 1 patient with 2 comorbidities, including hypertension and diabetes (5%) at the time of surgery.
4. **Tumor location:** In 7 patients, the tumor was located in the left breast and in 13 patients; the tumor was in the right breast.
5. **Vascular pedicle of nipple-areola complex:** This parameter was Sup. Med. in 8 patients (40%), inferior in 9 patients (45%), lateral in two patients (10%) and medial in one patient (5%).
6. **Surgical technique:** Vertical in 2 patients and Wise in 18 patients.
7. **Complication:** Surgical complications in the control group were reported as follows: erythema in three patients (15%), infection in one patient (5%), and the rest were uncomplicated (80%). On the other hand, erythema was observed in 13 patients (65%), infection in 2 patients (10%), and no complications in 25 patients (25%) in the case group.
8. **Satisfaction:** A satisfaction questionnaire was completed for each patient using the BREAST-Q form in Appendix (1). Surgical outcomes for all patients during the follow-up period were assessed based on scores from 0 (very dissatisfied) to 60 (very satisfied). The highest satisfaction score was 55, the lowest was 41, and the mean was 50.6, indicating satisfaction among all patients in our study.
9. **Scar score:** The scar score of two groups of patients, including patients with breast cancer treated with radiotherapy and controls, including healthy breasts who had undergone mammoplasty without radiotherapy, was calculated using the Vancouver Scar Questionnaire [Appendix 2] and entered into the relevant form. The mean Scar score in the case group was 5.3, and in the control group, 6.05.

Statistical results also evaluated as follows:

10. **Scar score:** According to Table (1), the statistical analysis of the scar score in patients showed a significant difference in scar score between case and control groups (P=0.028 <0.05).

Table 1. The scar score in the case and control groups

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Scar score case	5.3000	20	1.75019	.39135
	Scar score control	6.0500	20	2.01246	.45000

11. **Breast parenchymal ratio:** Using lateral images, the ratio of the area of the upper bridge to the lower bridge in case and control groups was measured. The mean of this ratio was 1.918 in the case group and 1.947 in the control group. Also, according to Table 2, statistical analyses showed no significant difference in breast parenchymal ratio between the case and control groups (*P*=0.760).

Table 2. Breast parenchymal ratio in the case and control group.

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Ratio area case	1.9190	20	.32976	.07374
	Ratio area control	1.9475	20	.53166	.11888

12. **Lower pole ratio:** Using frontal images, the width-to-length ratio of the lower pole was measured. The mean of this ratio was 1.837 in the case group and 1.739 in the control group. Also, according to Table 3, no significant difference in the lower pole ratio was observed between the case and control groups (*P*=0.091).

Table 3. Lower pole ratio in the case and control group

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Ratio trans case	1.8372	20	.21070	.04711
	Ratio trans control	1.7394	20	.11568	.02587

13. **Nipple displacement:** In the present study, it was also measured in all patients in both the case and control groups. Negative values indicate that the nipple is above the max projection line. Statistical analysis (Table 4) shows that there was no significant difference in nipple displacement between case and control groups (*P*=0.188).

Table 4. Nipple displacement in the case and control group.

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Dislocate case	-.2078	20	.35851	.08016
	Dislocate control	-.3052	20	.29607	.06620

14. **Max breast projection:** The mean max post-op breast projection in the case group was 7,217, and in control group was 6,932. In this case, Table 5 states no significant difference between the case and control groups (*P*=0.214).
15. **Mean projection of upper pole:** The mean projection of the upper pole was 3.35 in the case group and 3.185 in the control group. Table 6 presents the statistical analysis of the upper pole projection length; for this variable, no significant difference was observed between the case and control groups (*P*=0.462).
16. **Lower pole level:** The size of the lower pole level was measured in the lateral view; the

average for this parameter was 3.796 in the first group and 3.783 in the second group. Statistical analysis of this variable in Table 7 shows no significant difference between case and control groups (*P*=0.930).

Table 5. Breast maximum projection in case and control groups

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Max case	7.2175	20	.75256	.16828
	Max control	6.9321	20	1.07467	.24030

Table 6. Upper pole projection length in the case and control groups

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Upper case	3.3532	20	.82100	.18358
	Upper control	3.1852	20	.95832	.21429

Table 7. Lateral view of lower pole projection length in the case and control groups

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Lower case	3.7965	20	.48670	.10883
	Lower control	3.7840	20	.82478	.18443

17. **Nipple level:** The Nipple level was 6.750 in the case group and 6.373 in the control group. Table 8 also shows no significant difference between the values obtained in the case and control groups (*P*=105).
18. **Lower pole length and width:** Frontal view showed that the average length of the lower pole in the case group was 6.647, and in control group was 6.826, and the average widths were 11.939 and 11.826, respectively. Tables (9) and (10) show that there is no significant difference between the values obtained for the length and width of the upper pole from the front view in the two groups of control and case (*P*=0.163 and *P*=0.339).
19. **Satisfaction:** Table 11 shows the statistical distribution of patient satisfaction. In this study, the mean patient satisfaction score was 6.50.
20. -In examining the relationship between the type of vascular base of the nipple complex and aesthetic outcomes, it was determined that this parameter is related to the prominence of the upper bridge and the medial/Sup. The middle pedicle, which leads to a greater prominence of the upper pole than other pedicles (*P*=0.03).
21. -The study of complications between the case and control groups showed a significant difference in complications between the two groups (*P*=0.003). Statistical analysis of complications with other aesthetic outcomes did not show a significant difference between these parameters.

-No significant relationship was observed between other variables in this study.

Table 8. Nipple level in the case and control group

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Nipple case	6.7506	20	.96504	.21579
	Nipple control	6.3730	20	1.18732	.26549

Table 9. Frontal view of lower pole length in case and control

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Length case	6.6470	20	1.38616	.30996
	Length control	6.8261	20	1.14950	.25704

Table 10. Frontal view of lower pole width in case and control

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Width.case	11.9398	20	1.75596	.39265
	Width.cont	11.8267	20	2.11441	.47280

Table 11. Satisfaction in case and control

		Frequency	Percent	Valid percent	Cumulative percent
Valid	41	1	5.0	5.0	5.0
	44	1	5.0	5.0	10.0
	48	3	15.0	15.0	25.0
	50	6	30.0	30.0	55.0
	52	2	10.0	10.0	65.0
	53	1	5.0	5.0	70.0
	54	4	20.0	20.0	90.0
	55	2	10.0	10.0	100.0
	Total	20	100.0	100.0	

Discussion

In this study, some parameters were analyzed as criteria for evaluating the aesthetic results of the operation. All measurements were performed using DIGISIZER software on photographs taken after the patient's consent. We have examined the above parameters before analyzing the results and comparing them with the results of other studies.

As we know, it is difficult to evaluate changes in breast shape after surgery, such as the upper pole area, breast bulge, and lower pole aesthetic criteria, due to the lack of standardized systems for measuring breast shape and surgical results. Here, we introduce some of these criteria derived from the study of Eric Swanson (15).

Figure 1 presents the lateral and anterior views of the chest. In the lateral view, you will see a horizontal line along the maximum breast prominence, which is assumed to be the horizontal starting line for measuring other variables. A vertical line is also drawn as the posterior border of the chest, at the level of the suprasternal notch. The distance from this line to the edge of the chest along the horizontal line of maximum breast prominence is called the breast prominence. This line is also used to measure the nipple level. Ideally, the nipple should be level with it. The vertical distance between the maximum breast prominence line and the horizontal line passing through the suprasternal notch is divided into two equal parts, and from the obtained point a line is drawn horizontally that extends to the edge of the chest and is said: Upper pole prominence Lower pole level is the vertical distance between the lowest point of the chest and the maximum prominence line.

The ratio between the upper and lower pole areas is called the breast parenchymal ratio. High values of this ratio indicate a plump breast appearance, which most women are satisfied with. Lower ratios indicate sagging breasts. Nipple displacement is the vertical distance between the nipple surface and the maximum breast elevation. If the calculated value exceeds 1 centimeter, the nipple is displaced. Positive values are for levels below the maximum breast elevation line, and negative values are for levels above the maximum breast elevation line.

In the front view of Figure 1, the longitudinal distance of the lower bridge is halved, and its width is measured at this point. The ratio of the width to the length of the lower pole is a measure of the lower pole box.

It is possible that the nipple does not correspond to the raised breast surface, so we need to determine the ratio of the upper pole to the lower pole, or the degree of breast tissue sagging. This is why we use the breast line as the source of calculations. All measurements except the diameter of the areola correspond to this baseline. Therefore, if we assume the line is slightly higher or slightly lower, since our evaluation criteria are ratios, there will be no significant change in the results, and the results will remain reliable. The same assumptions are used to determine the point of the sternal notch.

As we know, the posterior chest wall does not change before and after surgery. Therefore, any lateral breast tissue located behind the posterior margin of the breast will not significantly affect our measurements.

Unlike the width of the breast, which is determined using the level of the lower pole, the length of the upper bridge is not easily measured. In this measurement system, we use the bony landmark at the sternal notch as the starting point for calculations. The sternal notch is located just above the upper edge of the chest. In this way, the length of the upper bridge protrusion can be measured using this source.

The measurements from the frontal photographs are used to assess the lower pole of the box, the quality of the stem, and the inverted T technique. Previously, there was no specific measurement to assess the lower pole, and for this purpose, only observation was sufficient.

In pseudo, the nipple is often higher than the maximum length of the breast bulge. This definition combines the nipple position and the gland position. For convenience, we measure these parameters separately by calculating the nipple displacement and the length of the lower pole to obtain the rate of glandular destruction.

In the frontal view, once the length and width of the lower pole are drawn, their ratio is easily calculated. In the lateral view, once the breast bulge and the level of the lower pole are determined, all parameters are drawn and measured with the above origin, which can give the surgeon a good idea of the surgical consequences. The nipple should be located along the maximum breast bulge (10). In the past, there was no need to measure the breast's shape and form, and the distance from the supraorbital depression to the nipple determined its shape (11). This criterion may change in horizontal mastopexy or breast sagging and, therefore, cannot be considered a reliable starting point for measurements (12-13).

The frontal view of the chest allows for assessment of the shape of the chest pole. Ideally, the breast is visible from the front as a semicircle when the patient is standing. The lower pole ratio should ideally be less than 2 to avoid a boxy breast (14).

Ideally, in a lateral view, the contour of the upper breast bridge is convex from the upper part of the breast to the point of maximum breast prominence (10,15). A peaked or linear contour at the upper pole is more common in patients who have undergone mastopexy or breast reduction (15).

The lateral view of the lower pole is relatively circular from the point of maximum breast prominence to the chest. In a mature or hypoplastic breast, the length of the lower pole is equal to the inframammary fold. In ptotic or hypertrophic breasts, the lateral curve will be oval. Ideally, the breast would become semicircular after surgery. Finding symmetry in these criteria without measurement may be hidden from the surgeon's view.

Figures 2 to 5 show patients from preoperative to 6 months after the end of radiation therapy. For example, in the first case, the lower pole ratio in this patient was 1.82, and in the control group, it was 1.81. The parenchymal ratio in the case group was 1.82, and in control group was 2.57; the nipple displacement in the case group was 0.17, and in control group was 0.9. The scar score was 3 in the case group and 6 in the control group.

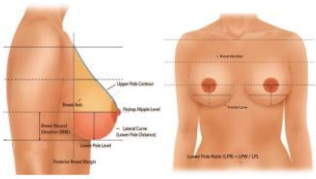

Figure 1. Lateral and frontal views of the breast

Figure 2. Patient #1: (A) Pre-op frontal view. (B) Post-op frontal view. (C) Lateral view 1 (D) Lateral view 2

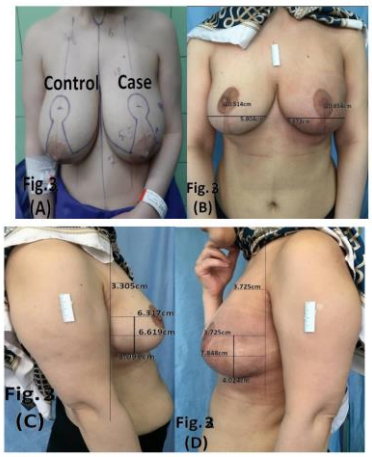

Figure 3. Patient #2: (A) Pre-op frontal view. (B) Post-op frontal view. (C) Lateral view 1 (D) Lateral view 2

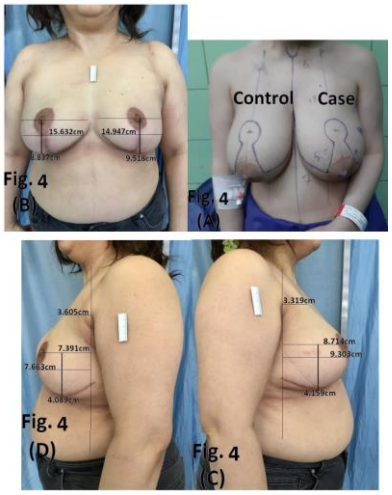

Figure 4. Patient #3: (A) Pre-op frontal view. (B) Post-op frontal view. (C) Lateral view 1 (D) Lateral view 2

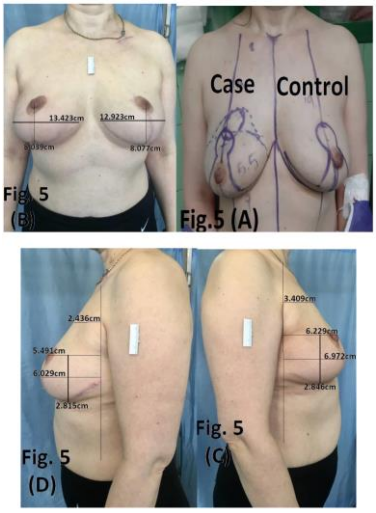

Figure 5. Patient #4: (A) Pre-op frontal view. (B) Post-op frontal view. (C) Lateral view 1 (D) Lateral view 2

In the front view, the lower pole shape can be evaluated. If the lower pole ratio is greater than 2, it will have a boxy appearance. Therefore, values less than that are ideal. In our study, the average ratio in the case

group was 1.83, and in control group was 1.73. The shape and form of the breast, along with the measurements mentioned earlier, led to the development of the characteristics referred to in the literature as beautiful breasts. The ideal breast parenchymal ratio is greater than or equal to 1.5, which was 1.918 in the case group and 1.947 in the control group. If the lower pole ratio is less than 2, the aesthetic result will be better. The third scale is nipple displacement; if this parameter is less than 1 cm (0.2 in the case group and 0.3 in the control group), the breast appears more beautiful.

These three ratios and scales were useful in quantifying the patients' aesthetics and were within the range of our patients in both the control and case groups. In the study by Eqro *et al*., which included 160 breast cancer patients, 117 of whom underwent immediate reduction mammoplasty, the mean age of the patients was 53.8 (range 22 to 80) years, and the mean body mass index was 33 kg/m2 (range 20 to 25), which did not significantly differ with the aesthetic outcomes (1). Also, 14% of the patients had diabetes, and 64% had hypertension, which did not significantly correlate with the aesthetic outcomes.

In 49.6% of patients, the tumor was in the left breast, and in 50.4% of them, the tumor was in the right breast, with no significant difference reported. The center of the stem was in 6.8% of patients, 8.5% in the inferolateral, 10.3% in the inferomedial, 53.8% in the supralateral, 18.8% in the superomedial, and 1.8% in a few patients without a significant difference. In terms of postoperative complications, 20.5% of patients reported infection (3.4%), hematoma (1.7%), and fat necrosis (0.9%), all with significant differences. There were other complications without a significant difference. In the Eqro study, the mean satisfaction score was 69.8, and patients who underwent reduction mammoplasty immediately after tumor removal were most satisfied with the procedure. Unfortunately, in this study, the evaluation of cosmetic outcomes was not based on measurable criteria; instead, the author summarized the results and stated that, despite a low mortality rate, they experienced cosmetic outcomes and patient satisfaction. In the study by Speer *et al*., (7), 11 patients who underwent bilateral reduction mammoplasty following breast tumor removal were examined after radiotherapy treatment. The mean age of the patients was 53 years, ranging from 35 to 74 years. Of the 22 breasts that underwent surgery, 8 were free nipple grafts, 7 were superomedial stem grafts, and 2 were superolateral stem grafts. Complications such as fat necrosis, hematoma, hypopigmentation, radiotherapy site, and keloids were also reported in 6 patients in this study. The mean satisfaction score was 3.3 on a scale of 1 to 4. A team of blinded plastic surgeons assessed the cosmetic outcomes in this article. Based on cosmetic results, evaluated on a scale of 1 to 4, the average cosmetic result score before radiotherapy was 2.8 to 3.5, and after radiotherapy was 2.4 to 3.4.

A study by Ariana *et al*., (9) included 9 patients with a mean age of 56.22 years and a mean body mass index of 30.02 kg/m2 who underwent the same surgery. Three patients were diagnosed with comorbid hypertension, and one patient with rheumatoid arthritis. Wound healing was reported in 22.2% of patients, with delayed healing and infection in 66.7%. Also, 33% of them developed scars after radiotherapy. However, hematoma, seroma, or fat necrosis was not reported in any of the patients. However, in this study, 33% of patients required revision surgery for reduction mammoplasty. In this study, the cosmetic consequences of this surgery were also investigated in the patients, and accordingly, 77.8% of patients expressed concerns about the symmetry of their breasts due to large ptosis. Three patients were evaluated for breast symmetry.

In our study, the mean age of the patients was 45.46 years with an age range of 31 to 64 years, which, according to the results, did not differ significantly from any of the outcomes or cosmetic surgical variables.

Also, in terms of body mass index, the mean BMI of our patients was 26.4295 kg/m2, the highest was 37.7 kg/m2, and the lowest was 21.1 kg/m2. Based on the results, there was no significant difference between the studied variables.

Thirteen patients in this study had no comorbidities (65%), 4 had diabetes (20%), 2 had hypertension (10%), and 1 had 2 comorbidities (5%). Based on the results, there was no significant difference in any of the surgical outcomes or the studied variables. In 7 patients, the tumor was located in the left breast (35%), and in 13 patients, in the right breast (65%). Based on the results, no significant difference was observed in any of the cosmetic surgical outcomes. Variable

In 8 patients (40%), the vascular base type of the nipple complex was Sapp. The drug was less in 9 patients (45%), lateral in 2 patients (10%), and Medial in 1 patient (5%). The surgical technique was vertical in 2 patients (10%) and in 18 patients (90%) in a wise manner, with no significant difference observed in the medial and superomedial types with upper pole prominence (P=0.03).

Surgical complications were observed in three patients (15%) as erythema, in one patient (5%) as

infection, and the remaining patients were uncomplicated (80%) in the control group. On the other hand, in the case group, complications were observed in 13 patients (65%), in 2 patients (10%) as infection, and in the rest (25%) as uncomplicated. According to the results, there was no significant difference between the case and control groups (P=0.003), and no significant difference in other aesthetic outcomes.

In this study, the surgical results for all patients during the follow-up period were evaluated based on scores from 0 (very dissatisfied) to 60 (very satisfied). The highest satisfaction score was 55, the lowest was 41, and the mean was 50.6, indicating satisfaction among all patients.

The mean Vancouver score in the case group was 5.3, and in control group was 6.05. Statistical analysis of the scar score in patients showed P=0.028, indicating a significant difference in scar score between the case and control groups (P<0.05).

In this study, cosmetic results were assessed after oncoplastic mammoplasty in the tumor-bearing breast and reduction mammoplasty on the opposite side to achieve symmetry. The affected breast underwent radiotherapy according to the protocol, and during follow-up, the variables and their relationships were investigated and determined.

The vascular base type of the nipple complex (medial-sup. Medial) is related to the prominence of the upper pole and medial-sup. The Medial has given more prominence to the upper pole compared to other stems, which is reasonable and acceptable in this regard. Stem design location.

Statistical analysis showed that the complications in the case and control groups were significantly different from each other. Considering the acute complication of radiotherapy on the affected side due to DNA damage and free radical production, it was justifiable and recognizable, and improved over time.

The Vancouver scar score for the case and control, which evaluated the effect of radiotherapy on postoperative scars and had a significant relationship, showed the effect of radiotherapy in reducing scar formation. Since radiotherapy is one of the colloid treatments and can reduce cell growth and prevent collagen from being deposited in the wound and injury, its effect in reducing scars can also be considered. However, since the therapeutic dose of radiotherapy is associated with systemic and local complications (erythema, infection, etc.), radiotherapy and prophylactic brachytherapy should be evaluated in another study to determine their risks and benefits.

BREAST -Q™
RECONSTRUCTION MODULE (POST OPERATIVE) 1.0

With your breasts in mind, in the past 2 weeks, how satisfied or dissatisfied have you been with:

		Very Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Very Satisfied
a.	How you look in the mirror clothed?	1	2	3	4
b.	The shape of your reconstructed breast(s) when you are wearing a bra?	1	2	3	4
c.	How normal you feel in your clothes?	1	2	3	4
d.	The size of your reconstructed breast(s)?	1	2	3	4
e.	Being able to wear clothing that is more fitted?	1	2	3	4
f.	How your breasts are lined up in relation to each other?	1	2	3	4
g.	How comfortably your bras fit?	1	2	3	4
h.	The softness of your reconstructed breast(s)?	1	2	3	4
i.	How equal in size your breasts are to each other?	1	2	3	4
j.	How natural your reconstructed breast(s) looks?	1	2	3	4
k.	How naturally your reconstructed breast(s) sits/hangs?	1	2	3	4
l.	How your reconstructed breast(s) feels to touch?	1	2	3	4
m.	How much your reconstructed breast(s) feels like a natural part of your body?	1	2	3	4

Appendix (1). BREAST-Q form

Evaluation of cosmetic outcomes of the bilateral reduction mammoplasty following the breast conserving surgery and unilateral radiotherapy in patients with breast cancer

Patients name

Vascularity	Normal Pink Red Purple
Pigmentation	Normal Hypopigmentation Hyperpigmentation
Pliability	Normal Supple Yielding Firm Ropes Contracture
Height	Flat <2mm 2-5mm >5mm

Appendix (2). Vancouver scar score

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