



## Comparison of Conventional vs. Oncoplastic Breast-Conserving Surgery in a Breast Unit with Oncoplastic Training

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### Abstract

**Purpose:** Oncoplastic Breast Conserving Surgery (OBCS) has been tested in oncological terms demonstrating that it is as effective as Standard Lumpectomy (SL) nowadays; Patients-Reported Outcomes (PRO) have become a relevant way to assess breast cancer treatment. The aim of this work was to compare OBCS with SL using a PRO measurement, BREAST-Q Breast Conserving Therapy (BCT) module.

**Methods:** One hundred and sixty-five patients with early primary breast cancer treated with BCT were questioned using BREAST-Q Version 2.0 BCT Module, postoperative scales, in Spanish, after radiotherapy treatment was administered. The patients filled in the questionnaire in a paper-and-pencil format at our breast unit. The sample size was estimated to observe differences of 7 points in the satisfaction with breast domain (postoperative scale) between both approaches. This difference is slightly higher than 10% of the median of satisfaction with breast domain reported in published studies. An analysis was done to compare statistics.

**Results:** SL was used in 108 patients and OBCS in 57. Patients treated with OBCS had a larger radiological lesion than patients treated with SL (median 20 mm vs. 15 mm) corresponding with a higher pathological tumor (17 mm vs. 13 mm). The time from the radiotherapy end date to when the questionnaire was filled in was longer in those patients treated with OBCS (mean 8 vs. 15.5 months). No significant statistical differences were found in the BREAST-Q postoperative domain scores between both approaches.

**Conclusion:** The quality of life and the satisfaction with the oncoplastic breast conserving approach or the standard lumpectomy evaluated by the BREAST-Q were similar in our breast unit.

**Keywords:** Oncoplastic breast-conserving surgery; Breast-conserving therapy; Patient-reported outcomes; BREAST-Q

### Introduction

Since the earliest articles [1-2], which demonstrated the advantages of Oncoplastic Breast-Conserving Surgery (OBCS) in the compliance of oncological surgical principles, some studies have been published showing that there are not any differences between both surgical approaches in terms of oncologic safety and their outcomes [3-9]. Nowadays, an earlier diagnosis and improved treatments mean that most women with breast cancer will survive long term and eventually die from unrelated causes. Therefore, some objectives which had been kept hidden, such as Quality of Life (QoL) and patient satisfaction have emerged, and as a result, Patient-Reported Outcomes (PRO) has become very relevant for the evaluation of the breast cancer management. A systematic review of PRO Measures (PROM) in the breast cancer treatment found five (EORTC QLQ BR-23, FACT-B, HBIS, BIBCQ, and BREASTQ) with adequate development and validation process [10]. BREAST-Q is focused on surgical procedures and a specific module has been developed for Breast Conserving Therapy (BCT). A recently systematic review found that the current evidence base is limited and not adequate to support or to reject the assumption that OBCS is associated with improved QoL [11]. This study aimed to compare Standard Lumpectomy (SL) versus OBCS in BCT by using a BREAST-Q BCT questionnaire, postoperative scale.

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## Methods

Patients with primary breast cancer who were treated with BCT at our Breast unit in 2017, 2018 and 2019 were called and invited to participate after radiotherapy was completed. Likewise, patients treated with BCT in previous years that had been attended to for follow-up at our outpatient clinic in 2019 were invited to fill in the questionnaire.

The study was approved by the Institutional Research Ethics Committee. The participants signed written informed consent and completed the questionnaire BREAST-Q Version 2.0 Breast-Conserving Therapy, Postoperative Scales, Spanish (ES) Version in a paper-and-pencil administration and returned it to our processing nurse. The BREAST-Q [12] is a validated, multidimensional questionnaire-based tool that assesses PRO measurements following breast surgery. There are different modules which evaluate some surgical procedures; the last one which was developed was for BCT.

The sample size of this study was estimated to observed differences of 7 points in the satisfaction with breast domain (postoperative scale) between surgical techniques SL vs. OBCS. This difference is slightly higher than 10% of the median of this variable according to previously published studies [13-20] and might be clinically relevant in scores related to QoL. A minimal important difference which establishes the smallest change in PROM score which patients perceive to be important has been proposed in four points for reconstruction module of BREAST-Q [21]. The sample size consisted of at least 133 patients, 104 SL and 29 OBCS. Clinicopathological data were collected from hospital electronic patient records and scores were derived to each of the questionnaire nine domains. These were transformed into a scale of 0 to 100 according to the BREAST-Q protocol, with a higher value representing a more favorable outcome.

## Statistical analysis

An analysis was undertaken using SPSS v25 (IBM Corp. Released

**Table 1:** Characteristics of patients, tumors and treatments.

Variable	Standard lumpectomy n (%) or median and interquartile range	Oncoplastic breast conserving techniques n (%) or median and interquartile range	p value
Patients	108	57	
Age, years	59 (12.78)	59 (10.21)	0.094
BMI, Kg/m <sup>2</sup>	25.6 (6.12)	26.8 (7.84)	0.019*
Menopausal	76 (69.7%)	46 (80.4%)	0.193
Active smoking	34 (31.2%)	11 (19.6%)	0.141
Comorbidities	54 (49.5%)	25 (44.6%)	0.551
Invasive cancer	92 (85.2%)	50 (87.8%)	0.702
<b>Intrinsic subtype</b>			0.020*
Luminal A	63 (68.5%)	22 (44%)	
Luminal B	14 (15.2%)	17 (34%)	
HER2+	10 (10.9%)	9 (18 %)	
Triple negative	5 (5.4%)	2 (4 %)	
Radiological preoperative size# (mm)	15 (9.5)	20 (15)	0.000*
Multifocal	6 (5.5%)	8 (14.3%)	0.055
Axillary lymphadenectomy	8 (7.3%)	9 (16.1%)	0.105
Affected surgical margins&	14 (12.8%)	3 (5.4%)	0.179
Re-operation <sup>o</sup>	12 (11%)	2 (3.6%)	0.143
Re-excision for Affected margins	10	1	
<b>Evacuation of hematoma</b>			
Completion axillary lymphadenectomy	2	1	
Bilateral surgery	1 (0.9%)	14 (25%)	0.000*
Pathological tumor size (mm)	13 (11.5)	17 (12)	0.001*
Time from the end of radiotherapy to complete questionnaire (months)	7.9 (10.3)	15.5 (24.45)	0.001*
Neoadjuvant chemotherapy	9 (8.3%)	6 (10.7%)	0.603
Braqui radiotherapy	20 (18.5%)	6 (10.7%)	0.261
Adjuvant chemotherapy	25 (22.9%)	13 (23.2%)	1
Endocrine therapy	89 (81.7%)	46 (82.1%)	0.938

### Variables and abbreviations.

**BMI:** Body Mass Index

#Radiological preoperative size (size of radiological lesion measured by magnetic resonance imaging if it was not done a mammography was used) and Affected surgical margin (ink on the tumor in pathological study)

**Comorbidities:** Arterial Hypertension, Diabetes, Cardiopathies, Corticoide or immunosuppression treatment

<sup>o</sup>Re-operation (new surgery because postoperative surgical complications, completion of axillary surgery or affected surgical margins)

**Statistical analysis:** U de Mann-Whitney and Chi-squared tests were used for comparison

\*Statistical significance

**Table 2:** Results of BREAST-Q BCT module postoperative scale.

Domain	Standard lumpectomy (median and p25-p75)	N (answered questionnaires), %	Oncoplastic Breast conserving techniques (median and p25-p75)	N (answered questionnaires), %	*P value
Satisfaction with the breast	59 (57-68.25)	106 (98.14)	59 (55-72)	57 (100)	0.879
Adverse effects of radiotherapy	80 (63.25-100)	100 (92.59)	80 (71-100)	53 (92.98)	0.388
Psychosocial well-being	82 (64-100)	105 (97.22)	87 (71-100)	56 (98.24)	0.079
Sexual well-being	66 (55-89.5)	90 (83.33)	66 (50.5-90.5)	48 (84.21)	0.916
Physical well-being	71 (59-82)	75 (69.44)	74 (60-89)	46 (80.70)	0.288
Satisfaction with information	64 (56-91)	104 (96.29)	73 (58-100)	55 (96.49)	0.099
Satisfaction with surgeon	100 (81.75-100)	106 (98.14)	100 (100-100)	57 (100)	0.087
Satisfaction with other members of medical team	100 (100-100)	106 (98.14)	100 (100-100)	57 (100)	0.492
Satisfaction with other members of office staff	100 (100-100)	105 (97.22)	100 (100-100)	56 (98.24)	0.141

All of results had not a normal distribution

P25-p75 (percentile 25-percentile 75)

\*Comparison was done using U de Mann-Whitney test

2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). Kolmogorov-Smirnov test was used to test normal distribution of variables. To describe descriptive statistics we used median and interquartile range (percentile 25 to percentile 75) and percentages. Comparisons between variables and scores were done by U Mann-Whitney and Chi-squared tests. Statistical significance was determined when p values were <0.05.

## Results

A total 165 patients had BREAST-Q data available for analysis; 191 patients were invited to participate, 26 patients (13.6%) of them did not fill in the questionnaire for different personal reasons. Demographics of 165 patients, 108 treated with standard tumorectomy and 57 with oncoplastic techniques are described in Table 1. All quantitative variables except for the age did not have a normal distribution. OBCS techniques were: reduction mammoplasty with T- inverted pattern incision (39.68.4%), round-block (9.15.8%), vertical mammoplasty (5.8.8%) and racquet mammoplasty (4.7.0 %). In all, 14 patients (8.5%) were re-operated on because of affected margins (11, 10 SL and 1 OCBS groups), completion axillary lymphadenectomy (1 OCBS) and postoperative complications- hematoma (2 SL). Scores of BREAST-Q BCT domains are shown in Table 2.

## Discussion

In our breast unit where oncoplastic approach is available a comparison between conventional and oncoplastic breast conserving surgery in BCT using Breast-Q questionnaire did not find significant differences. Our study was designed to detect differences with clinical relevance in satisfaction with breast domain which is clearly related to cosmetic outcome and surgical technique. Both groups had same satisfaction with breast score, a median of 59 over 100. SL and OBCS groups differed with statistics significance in body mass index, radiological lesion size, pathological tumor size, bilateral surgery (contralateral breast) and time passed from the end of radiotherapy to survey. OBCS was used in patients with large tumors requiring large excision; consequently, they were at risk of having breast cosmetic sequela. In OCBS the percentage of affected margins and re-operation was lower (5.4 vs.12.8 and 3.6 vs. 11, respectively) and axillary lymphadenectomy was carried out in more patients (16.1 vs. 7.3%). These findings agree with the fact that OBCS attains large surgical specimens with wider surgical margins 22 and lymph nodes involvement is more frequent in large tumors. Although the range of oncoplastic techniques is wide, two of them,

therapeutic mammoplasty-wise pattern reduction and round-block are the most frequently used [23,24] in this study consisted of 84.2%. Eighty percent of patients were surveyed at least six months after radiotherapy was completed. This time seems to be advisable because this is needed for short term side effects, such as breast pain, swelling, skin changes, numbness, etc. to disappear or diminish. After analyzing the outcome of all patients, the PROs evaluated by using the BREAST-Q BCT postoperative scale were very similar to the ones which have been reported by previously published articles [18-19] and we observed the same fact as these authors. The satisfaction with the information given by the surgeon scored around twenty points below other domains, such as the satisfaction with the surgeon or the rest of the health providers, the medical team or the office staff in both groups. This observation should be analyzed because information is vital and crucial in the entire management of breast cancer and more specifically in decision-making by patients [25]. A plausible explanation for our outcomes is that the OCBS approach improves the outcome of the SL cohort by avoiding treating patients at risk of cosmetic sequela if they are treated with a simple lumpectomy. Bearing this possibility in mind, we propose that an oncoplastic approach should be evaluated for its side effects (externalities), such as a reduction of the percentage of reoperation for affected surgical margins, the increment of the percentage of breast-conserving surgery avoiding mastectomies with difficult breast reconstruction (extreme oncoplastic approach) and improving cosmetic results of a conventional lumpectomy, minimizing the risk of severe aesthetic sequela. In our breast unit, no significant statistical differences were found between oncoplastic breast conserving approach or standard lumpectomy evaluated by the BREAST-Q. Satisfaction with breast domain which is clearly related to cosmetic outcome and surgical technique was the same in both approaches.

## Study Limitations

Although the sample size is large enough to detect clinical differences in BREAST- Q domains, it is limited one to offer robust outcomes. This limitation reinforced by the fact that patients came from a breast unit in which most of the oncoplastic procedures were carried out by the same surgeon, prevents extrapolating our results to other breast units. Another limitation is that the study did not include volume-replacement oncoplastic techniques. In our opinion, this limitation is less important because these techniques are currently used infrequently. The timing when patients were questioned seems to be advisable to evaluate cosmetic outcomes, but there was a

difference between both approaches, which ideally should be avoided.

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