

Peer Review File

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Reviewer A

Comment 1: The numbers are very low and there is a low rate of completion of the questionnaires 31.6% and 37.7% are very low rates.

Reply 1: Thank you for your comment. Unfortunately, this is a limitation of our study due to patients declining the survey and the difficulties of virtual visits during the COVID-19 pandemic. We mention this limitation in the last paragraph of the discussion (see page 20, lines 399-405); however, we will specifically mention our rates of completion in the limitations section in order to be more explicit.

Changes in the text: (See page 20, lines 399-405) "Our study has several limitations. Firstly, the relatively small number of patients studied overall, in addition to the even smaller amount who filled out all the BREAST-Q questionnaires (31.6% and 37.7% for OBCS and mastectomy with reconstruction, respectively), reduced the power of our conclusions. If we had been able to collect more surveys, we also could have also stratified the results by stage of disease. The COVID-19 pandemic was a significant contributor to difficulty acquiring these surveys, as it increased loss to follow-up and resulted in more virtual visits, during which BREAST-Q forms were not collected."

Comment 2: Compare 57 patients with OBCS with 204 with mastectomy does not seems to be proportionate.

Reply 2: Thank you for your comment. While we recognize the discrepancy in total patients between the groups, this is due to the fact that mastectomy is more common than OBCS. We hope this data will highlight the benefits of OBCS and make it a surgery that can and will be offered more.

Changes in the text: NA

Comment 3: They did the study with non-Caucasian population at the Bronx but there are no references of previous studies in caucasian population and the differences in results between them. Why would it be different? There is no explanation in the work related to that.

Reply 3: Thank you for your comment.

Firstly, as mentioned in the introduction/background section, none of the data we found comparing OBCS to mastectomy even included the race or ethnicity of their participants (see page 6, lines 98-105 & page 16 lines 311-318). The oncoplastics literature in general rarely includes demographic data on race/ethnicity, and the studies that do mention it have largely Caucasian cohorts.

Secondly, and more importantly, including data on the race, ethnicity, and socioeconomic status of patients in research studies is crucial, as social determinants of health are known to have significant effects on health outcomes. Underserved populations such as our Bronx population face significant barriers to

accessing care such as difficulties in transportation and dramatic costs associated with healthcare. Most of our cohort is uninsured or on Medicaid which highlights these patients' socioeconomic disadvantage. These difficulties in acquiring care along with decreased health literacy is particularly relevant in oncology as these factors lead to later stages of disease on presentation in such populations.

Additionally, lower socioeconomic status is correlated with higher BMIs and the average BMI of our cohort is in the obese range. Higher BMI affects initial tumor detection, operative complication rates, and aesthetic satisfaction post-operatively, so it is important to study populations with high BMIs as well.

Lastly, patient-reported outcomes, specifically those relating to one's sexuality and satisfaction with appearance, are heavily influenced by cultural norms and societal standards. Patients from different backgrounds have different perceptions of what beauty is and what an "ideal" female form looks like. Thus, it is crucial to study the effect of different operations on PROs in a wide range of patient demographics, as the impact of fully removing breasts via mastectomy may vary significantly based on the patient's background and expectations. Thus, by gathering data on these minorities otherwise underrepresented in medical research, we can help give all patients, not just Caucasian ones, evidence-based recommendations in pre-operative planning.

We realize that we did not specifically cite many of these reasons in the text, so we will add some of this commentary in the introduction section to be more explicit.

Changes in the text: See pages 6-7, lines 105-119.

Reviewer B

Comment 1: I read with interest your work which addresses one of the main themes of modern breast medicine: patient satisfaction. That magnificent tool that is the BREAST-Q is fundamental for this purpose, **it would be advisable to update an explanation note on data collection in the discussion. In the sense that interviews carried out at different times post-operatively may have influenced the evaluation (better perception further away from the operation?)**

Reply 1: Thank you for your comment. This is a very good point and interesting thought. It would make sense that time since the procedure would influence patient satisfaction. In going through the data the times of the last post-op survey seemed to be similar between the groups but nonetheless this is quite relevant. Ideally, we would have analyzed the data separately at each time point but unfortunately we don't (yet) have enough data to do so.

Changes in the text: We added this limitation into our discussion section: "Furthermore, comparing surveys filled out at different time points post-operatively may have influenced PROs, as patients may have a better perception further away from the operation itself. If we had been able to collect more surveys, we could have stratified comparisons by different time points" (See page 20, lines

405-408).

Comment 2: I would suggest moving the paragraph lines 163-169 from 3.2 to 3.4 where oncological safety is discussed.

Reply 2: Thank you for your suggestion, we agree and have made the appropriate changes in the text.

Changes in the text: See new paragraph location on page 14, lines 263-269.

Comment 3: Line 130-153-204 206 there are numbers written in letters that I would convert to Arabic numbers

Reply 3: Thank you for your comment. Our understanding was that since those numbers started sentences, we should spell them out, but we have adjusted accordingly.

Changes in the text:

See page 8, line 148: "eighty-nine percent" changed to "89%."

See page 9, line 171: "forty-five" changed to "45."

See page 11, lines 199 & 201: "eighteen" and "twelve" changed to "18" and "12" respectively.

Reviewer C

OBSC vs MASTECTOMY in underserved people is an interesting topic.

Unfortunately, the paper has several serious flaws. Therefore, I recommend to reject it. Nonetheless, I would like to give you some recommendations.

Comment 1: The study design has a methodological bias. in fact **the authors compare compares two groups that are not homogeneous in terms of age and follow-up; these parameters greatly influence patient satisfaction.** For example older patients have more moderate aesthetic parameters than young patients and are more focused on the disease. it would have been more useful to compare the satisfaction of patients with comparable age.

Reply 1: Thank you for your comment. We agree that this is a significant limitation of our study. We have included this particular effect that age could have had on our PROs in the discussion within the paragraph on limitations.

Changes in the text: We mentioned the difference in age between the groups in the limitations section of our discussion (see page 20, lines 409-412), but have now also added, "The difference in age is also significant, as the patients in the mastectomy group were younger and younger patients can have higher aesthetic standards, potentially resulting in worse PROs post-operatively" (see page 20, lines 413-415).

Comment 2: Another one several limitation are the relatively small number of patients (only 31 vs 38%) who completed the BREAST-Q questionnaires.

Reply 2: Thank you for your comment. Unfortunately, this is a limitation of our

study due to patients declining the survey and the difficulties of virtual visits during the COVID-19 pandemic. We mention this limitation in the last paragraph of the discussion (See page 20, lines 399-405); however, we will specifically mention our rates of completion in the limitations section in order to be more explicit.

Changes in the text: (See page 20, lines 399-405): “Our study has several limitations. Firstly, the relatively small number of patients studied overall, in addition to the even smaller amount who filled out all the BREAST-Q questionnaires (31.6% and 37.7% for OBCS and mastectomy with reconstruction, respectively), reduced the power of our conclusions. If we had been able to collect more surveys, we also could have also stratified the results by stage of disease. The COVID-19 pandemic was a significant contributor to difficulty acquiring these surveys, as it increased loss to follow-up and resulted in more virtual visits, during which BREAST-Q forms were not collected.”

Reviewer D

The paper is generally very thorough and well-written, it is concise yet well described and organized into brief but clear paragraphs. It addresses an interesting gap of knowledge and could fit well among the many studies evaluating PROs in oncoplastic breast surgery with standardized tools such as BREAST-Q. I have, however, several concerns with the study’s strength:

Major concerns:

Comment 1: While the overall cohort is comprised by a satisfactory number of patients, this appears less and less to be the case as the paper goes on in reporting the various outcomes. The abstract focuses on PROs and oncological follow-up as main outcomes. However, PROs are reported for a very small number of patients, therefore the study’s strength is limited even though the conclusions appear to be statistically significant.

Reply 1: Thank you for your comment. Unfortunately, this is a limitation of our study due to patients declining the survey and the difficulties of virtual visits during the COVID-19 pandemic. We mention this limitation in the last paragraph of the discussion (See page 20, lines 399-405); however, we will specifically mention our rates of completion in the limitations section in order to be more explicit.

Changes in the text: (See page 20, lines 399-405): “Our study has several limitations. Firstly, the relatively small number of patients studied overall, in addition to the even smaller amount who filled out all the BREAST-Q questionnaires (31.6% and 37.7% for OBCS and mastectomy with reconstruction, respectively), reduced the power of our conclusions. If we had been able to collect more surveys, we also could have also stratified the results by stage of disease. The COVID-19 pandemic was a significant contributor to difficulty acquiring these

surveys, as it increased loss to follow-up and resulted in more virtual visits, during which BREAST-Q forms were not collected.”

Comment 2: Furthermore, a median follow-up of 24 months is too short to advocate with certainty for oncological safety. While the authors report correctly that many studies have already shown this, I wouldn't focus too much on it as an outcome in the population in study.

Reply 2: Thank you for your comment. We completely agree that in our small cohort with a short follow-up period it is very difficult to make strong claims about the oncologic safety of the two procedures; however, as you noted, prior literature with much longer follow-up came to the same conclusion we did that there is no significant difference between OBCS and mastectomy recurrence rates. The focus of our paper is indeed on PROs and how various demographic and procedural variables affect them, given the relative scarcity of literature on how ethnicity, race, BMI, and insurance status influence both patient satisfaction and surgical outcomes. Much of the past literature has focused on the oncologic safety of OBCS, so that was not our focus, but we did want to include basic safety measures such as conversion-to-mastectomy rate, positive margin rates, and recurrence rates to ensure that our population was comparable to the established literature on those variables.

Changes in the text: NA

Comment 3: Also, the Authors do not mention what kind of statistical test was used to compare survivals.

Reply 3: Thank you for your comment. We did not report on survival/mortality rate as with our short length of follow-up we did not feel that these data would have much added value. Do you mean something other than mortality rate by “survivals?” If so, please let us know and we would be happy to comment further.

Changes in the text: NA

Comment 4: To this regard, I noticed that while the overall number of OBCS was quite small, two less common sub-groups were well represented in your population: patients with DCIS and patients post-NACT. Maybe you could **expand a little both in the results and in the discussion by focusing on these subgroups**: in the case of large DCIS, for example, many clinicians are still uneasy with OBCS, and very few studies with small samples of patients have evaluated the efficacy of this technique.

Reply 4: Thank you for your comment. We appreciate you pointing out these intriguing subgroups and have added specific data on them in both the results and discussion specifically on their oncologic outcomes. If there are other measures you would like us to include, please let us know.

Changes in the text: We added: “Among the 15 patients with DCIS who underwent OBCS, only one had positive margins (6.7%) treated with a mastectomy and none of them experienced a local or distant recurrence. Of the 11 OBCS patients (19.3%)

who had neoadjuvant chemotherapy, one had positive margins (9.1%) treated with a mastectomy and another one had a local recurrence in the lumpectomy site treated with a mastectomy and is now in remission” to the results section (see page 13, lines 252-256).

We also added to the discussion section: “In focusing on OBCS patients with DCIS and those who received neoadjuvant chemotherapy, two less common sub-groups in the OBCS literature, their recurrence and positive margin rates were similar to that of the cohort overall. The DCIS subgroup had a 6.7% positive margin rate and a 0% recurrence rate. The neoadjuvant chemotherapy group had a positive margin rate of 9.1% and a recurrence rate of 9.1%” (see page 17-18, lines 346-350).

Comment 5: In the methods section you mention using T-tests for numerical variables. Numerical data collected on breast cancer is seldom normally distributed. **Please specify whether you assessed distribution and with what test, and apply a non-parametrical test if the data does not have a normal distribution.**

Reply 5: Thank you very much for your comment. We have adjusted our statistical analysis as follows:

We went through each column of the dataset and assessed for normality. We used a combination of visual assessment using Q-Q plots and mathematical interpretation using a Shapiro-Wilk test. If the data was normally distributed, we left it alone as the unpaired 2-tail t test we used when we first submitted, which is a parametric test. If a numerical data column was not normally distributed (which was likely), we performed a non-parametric equivalent of the t test called the Mann-Whitney test.

With these adjustments, we had some subtle changes in p-values, although most of these changes did not affect statistical significance of p-values, with the following exceptions. Firstly, the subgroup of mastectomy patients who did receive adjuvant radiation now also has significantly lower satisfaction with breasts as compared to the OBCS group. Secondly, the subgroup of mastectomy patients who did not receive radiation now also has significantly lower satisfaction with outcome as compared to the OBCS group. In summary, now regardless of receiving adjuvant radiation or not, mastectomy patients have significantly lower satisfaction with breasts and with outcome as compared to OBCS patients. Thirdly, breast satisfaction post-OBCS is no longer significantly higher than pre-OBCS. Lastly, the very weak negative correlation between complications and satisfaction with outcome among the OBCS patients is no longer present.

Changes in the text: We have added this description of our statistical analysis into the methods section as follows:

“In terms of statistical analysis, a Chi-square test was performed for categorical variables. For numerical variables, normality was first assessed for each variable using a combination of visual assessment using Q-Q plots and mathematical interpretation using a Shapiro-Wilk test. If the data was normally distributed, an unpaired 2-tail T-test was performed. If a numerical data was not normally

distributed (as was often the case), a non-parametric equivalent of the T-test called the Mann-Whitney test was used.” (See page 8, lines 130-137)

Additionally, we added footnotes in the tables to indicate which variables were normally distributed and thus which p-values were calculated using an unpaired 2-tail T-test. All other p-values for numeric variables were calculated using the non-parametrical test.

We have also adjusted the results section to reflect the adjustments in the statistics that changed statistical significance of some of the PROs within the mastectomy + radiation subgroups: “Of note, mastectomy patients had significantly lower “satisfaction with outcome” and “satisfaction with breast” than OBCS patients, regardless of whether they had adjuvant radiation or not” (See page 11, lines 213-215). As well as the changes to the correlations: “There were no correlations between overall complications and post-operative “satisfaction with breast” (OBCS: $r = -0.07$; Mx: $r = -0.21$) or “satisfaction with outcome” (OBCS: $r = 0.10$; Mx: $r = 0.17$) in either group. Similarly, there were no correlations between infection and post-operative “satisfaction with breast” (OBCS: $r = 0.33$; Mx: $r = -0.24$) or “satisfaction with outcome” (OBCS: $r = 0.27$; Mx: $r = 0.09$) in either group (**Table 2**)” (see page 14, lines 275-279).

Similarly, we removed the line “Breast satisfaction was significantly higher post-OBCS than pre-OBCS” from the results section of the abstract since the p-value is now 0.06 from 0.01 previously, and thus no longer significant.

Lastly, we highlighted all other non-statistically significant changes in the data due to these adjustments both in the text and in the tables.

Comment 6: Please specify how many people in the Afro-american and Hispanic groups completed BREAST-Qs.

Reply 6: Thank you for the suggestion. We agree that this would be very pertinent and helpful additional knowledge.

Of the OBCS patients who filled out BREAST-Q, 7/18 identified as African-American, 3/18 as white, 5/18 as other, 2/18 declined, and 1/18 as Asian. In terms of ethnicity, 7/18 identified as Hispanic, 8 identified as non-Hispanic, and the rest declined.

Of the mastectomy patients who filled out BREAST-Q, 26/77 identify as African-American, 37/77 as other, 4/77 as white, 2/77 as Asian, 1/77 as Indian, and 7/77 declined. In terms of ethnicity, 33/77 identified as Hispanic, 36/77 as non-Hispanic, and the rest declined.

Worded differently, of the Black patients who underwent mastectomy, 26/62 (41.9%) filled out BREAST-Q, and of the black patients who underwent OBCS, 7/26 (26.9%) filled out BREAST-Q. Of the Hispanic patients who underwent mastectomy, 33/80 (41.3%) filled out BREAST-Q, and of the Hispanic patients who underwent OBCS, 7/21 (33.3%) filled out BREAST-Q. Thus, the rates of BREAST-Q completion in these subgroups is similar to the rates within each group as a whole.

Changes in the text: We added these specific demographic breakdowns of the patients who filled out BREAST-Q in the results section (see page 11, lines 203-

208).

Comment 7: Please note that in presenting the mastectomy patients on page 8 (lines 141-143), the total does not add up to 204 patients.

Reply 7: Thank you very much for noticing this error. The number of mastectomy patients with stage 0 disease was indeed 31/204 as noted correctly in table 1. In an earlier edit we added the data on stages into the text from the table, so the error most likely occurred then.

Changes in the text: Changed “29/204 (14.2%) had stage 0 disease” to “31/204 (15.2%) had stage 0 disease” (see page 9, line 158).

Minor concerns:

Comment 8: Methods section in abstract should report how many patients were enrolled

Reply 8: Thank you for your comment. We included the numbers in each group in the abstract.

Changes in the text: Changed “A retrospective chart review was performed for patients treated with OBCS or mastectomy with reconstruction from 2015 to 2021” to “A retrospective chart review was performed for 57 patients treated with OBCS and 204 patients treated with mastectomy with reconstruction from 2015 to 2021” (see page 3, lines 42-43).

Comment 9: Highlight box appears incomplete

Reply 9: Thank you for your comment. This was unfortunately a formatting error that caused the last sentence to be cut off by the end of the box.

Changes in the text: We have resolved this formatting error (see page 4).

Comment 10: page 9 line 153 I believe you are referring to neo-adjuvant endocrine therapy

Reply 10: Thank you for noticing this detail, we are referring to neoadjuvant endocrine therapy. We updated the text to reflect that

Changes in the text: Changed “Nine of 57 (15.8%) OBCS patients received adjuvant endocrine therapy” to “Nine of 57 (15.8%) OBCS patients received neoadjuvant endocrine therapy” (see page 9, lines 170-171).

Comment 11: page 9 line 155 please explain how come only 78,9% of OBCS had adjuvant radiation therapy, as it is standard treatment after conservative surgery.

Reply 11: Thank you for your comment. The rest of the patients were either lost to follow-up or began receiving care elsewhere where we could not confirm what adjuvant therapy they had received.

Changes in the text: Added this explanation in the text: “Of note, it could not be confirmed if the remaining 12 OBCS patients received adjuvant radiation therapy

despite it being the standard of care, as they were lost to follow-up or transitioned their care to an outside hospital with inaccessible records” (See page 10, lines 173-175).

Comment 12: page 9 line 165 please elaborate as to what kind of mastectomy and whether with reconstruction, especially considering the difficulty of performing a conservative mastectomy where a OBCS skin incision has already occurred.

Reply 12: Thank you for your comment. All four of the patients with positive margins in the OBCS group underwent mastectomy with reconstruction. Two underwent nipple-sparing mastectomies while the other two underwent radical modified mastectomy.

Changes in the text: We included these details in the text: “All four patients in the OBCS group with positive margins underwent mastectomy (two nipple-sparing and two radical modified mastectomies) (7.0%) with reconstruction and of those, two received post-mastectomy radiation.” (See page 13, lines 246-248)

Comment 13: page 9 line 168 please elaborate as it is unusual for a mastectomy patient to undergo re-excision

Reply 13: It is unclear from chart review exactly why these patients underwent re-excision. One of the patients had a nipple excision after a nipple-sparing mastectomy with positive margins. The other patient had significant complications after a skin-sparing mastectomy including a seroma with wound opening requiring a return to the OR for wound closure, seroma drainage, and nipple areolar reconstruction in addition to the positive margins, so at that time they also re-excised some breast tissue.

Changes in the text: NA

Comment 14: page 10 line 186 I believe results should be expressed based on the total number of tissue expander patients (ie: 81/138; 33/138 etc)

Reply 14: Thank you for your comment. Results were changed so the denominator expresses the total number of tissue expander patients. Percents were also changed accordingly.

Changes in the text: “Of those patients with an immediate TE, 81/138 (58.3%) had a delayed implant placement, 33/138 (23.9%) patients had delayed autologous reconstruction, 8/138 (5.8%) had the TE removed due to infection, 9/138 (6.5%) were awaiting the second stage of reconstruction at the time of this study, and 7/138 (5.1%) were lost-to-follow-up” (See pages 10-11, lines 193-197).

Comment 15: page 11 line 202 please express chi-square results and statistical significance

Reply 15: Thank you for your comment. We have added the p-values for both the local and distant recurrence rates in both the table and in the text.

Changes in the text: See table 1 and see page 13-14, lines 260 & 262.

Comment 16: page 12 line 235 please add to the methods section what kind of statistical test was performed.

Reply 16: For the correlations, we did a Pearson correlation (parametric) on normally distributed data and a Spearman correlation (nonparametric equivalent) on non-normal distributions.

Changes in the text: We added this description into the results section (see page 8, lines 135-137).

Comment 17: Results section: tables are presented in a sparse order

Reply 17: Thank you for your comment. We are unfortunately not exactly sure what you mean by “sparse order,” but we did notice that the numbering of the tables did not match the order in which the tables were mentioned in the text. Additionally, we increased the number of references to the tables to assist in reading the results section. If this is not the correct interpretation of your comment, please let us know, and we would be happy to further adjust the results and/or tables.

Changes in the text: We have reordered the results section so that “patient reported outcomes” is now 3.4 and “oncologic safety” has become 3.5. Additionally, we have better organized the sections so that all the mentions of PROs from the “type of surgery” section have been moved to the “patient reported outcomes” section. We also switched the order of the tables to match the order in which they are mentioned in the text given all these changes.

The additional references to the new table numbers are highlighted in the text throughout the results section.

Comment 18: Table 1 is not easily readable as rows tend to overlap in some points, please organise in separate rows.

Reply 18: Thank you for your comment.

Changes in the text: We have reformatted all tables so that each data input has its own row within the table (See Tables 1 and 3).

Comment 19: Table 2 is a little too crowded, maybe you could split in two separate tables.

Reply 19: Thank you for your comment. We agree and have adjusted the tables accordingly.

Changes in the text: The information on additional surgery and complications has been moved to Table 1. The previous Table 2 is now two tables, the first of which being the direct comparison PRO data between the groups (now Table 3) and the second of which is all the correlations between the PROs and other variables (now Table 2).