Breast Cancer

Quality of Life Post Breast Cancer Surgery: Comparison of Breast Conservation Surgery versus Modified Radical Mastectomy in a Developing Country

Kurian Cherian¹  Nitish Rajan Acharya¹  Rexeena V. Bhargavan¹  Paul Augustine¹©  Jagathnath K.M. Krishnan¹©

¹Department of Surgical Oncology, Regional Cancer Centre, Thiruvananthapuram, Kerala, India

Address for correspondence Rexeena V. Bhargavan, MCh, Department of Surgical Oncology, Regional Cancer Centre, Thiruvananthapuram, Kerala, 695011, India (e-mail: rexy.doc@gmail.com).

Abstract

Introduction  Breast cancer survivors are the largest group of female cancer survivors. Oncologic breast surgery can have a profound impact on a woman’s body image and sense of self that can significantly affect their quality of life (QOL). The paucity of data about the effect of type of surgery on QOL of Indian breast cancer survivors has led to this study.

Materials and Methods  This prospective study included consecutive female early breast cancer patients who underwent primary surgery, that is, breast conservation surgery (BCS) or modified radical mastectomy (MRM) from January 1, 2015 to December 31, 2015. The primary objective was the comparison of QOL using European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and EORTC QLQ-BR 23 between the two groups at 6 months and 1 year post surgery with the baseline.

Results  One hundred and thirty-eight patients were included of which 62 underwent BCS and 76 underwent MRM. BCS patients fared better with respect to physical functioning, dyspnea, fatigue, appetite loss, and body image at 6 months (\(p < 0.05\)) as compared with MRM. At 1 year post surgery, BCS patients fared better with respect to physical functioning, role functioning, global health status, body image, sexual enjoyment, and dyspnea, while MRM patients fared better in emotional functioning and future Prospective (\(p < 0.05\)).

Conclusion  Patients undergoing BCS have a better QOL with respect to various functional and symptom scales at 6 months and 1 year. However, patients undergoing MRM perform better in terms of future perspective and emotional functioning at 1 year.
**Introduction**

Breast conservation surgery (BCS) is now a well-established alternative to modified radical mastectomy (MRM).\(^1\)–\(^3\) Twenty-year follow-up of these patients has shown equivalent survival.\(^1\)–\(^3\) Multidisciplinary management has improved the overall survival of breast cancer patients in all stages. Women with a history of breast cancer are the largest group of female cancer survivors and account for \(~41\)% of the total.\(^4\) The earlier stage at diagnosis and the use of multimodality therapy have improved the likelihood of long-term disease-free survivorship.

Oncologic breast surgery can have a profound impact on a woman’s body image and sense of self. To date, the relative impact of these various surgical therapies on patients’ satisfaction and quality of life (QOL) remains unclear. Most studies have analyzed populations in the developed countries, which may differ substantially from those in less developed geographic regions. Indian women differ in ethnic, social, cultural as well as economical aspects as compared with Western women. There is little data available about treatment preferences among Indian women, whose wishes regarding cosmetic results or other factors may differ from those in the West. The data available are contradictory with some studies showing worse QOL in BCS patients in India.\(^5\) A recent systematic review shows discordance in QOL with respect to the type of surgery in Asian patients.\(^6\) The paucity of data regarding the QOL issues after breast cancer surgery in the Indian population in spite of the heavy disease burden has led to this study.

**Materials and Methods**

This is a prospective study performed in the Department of Surgical Services, Regional Cancer Center, Thiruvananthapuram, Kerala, India. This study was conducted after Institutional Review Board and Ethics Committee clearance. The duration of the study was from January 1, 2015, to December 31, 2015. Women with pathologically proven early breast carcinoma undergoing primary MRM or BCS were recruited for the study. Pregnant or lactating women and women with bilateral breast cancers were excluded from the study. The primary objective of the study was to compare the QOL between patients undergoing BCS and MRM at baseline, 6 months, and 1 year postsurgery period. For a power of \(80\)%, an \(\alpha\) error of 5%, and a \(\beta\) error of 20%, a sample size of 138 was calculated.

Written informed consent was obtained from all patients. The validated Malayalam version7 of the European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and the QLQ-BR23 was filled by all the participants, immediate presurgery, 6 months postsurgery, and 1 year postsurgery. Data was entered using SPSS software, Version SPSS 11.0.1. (LEAD Technologies, Inc., Charlotte, North Carolina, United States of America) and scored as per the scoring manual. Categorical variables were summarized using frequencies and its corresponding percentages. The continuous variables were expressed in terms of mean and standard deviation. The independent sample t-test was used to compare postsurgery 6 months and 1 year with baseline. \(p\)-Value \(< 0.05\) was considered to be statistically significant.

**Results**

One hundred and thirty-eight patients were included in the study. Sixty-two patients underwent BCS and 76 patients MRM. None of the patients underwent any reconstructive procedure. The patient characteristics are summarized in Table 1. The median age of patients undergoing BCS was 43 years (range: 34–71 years), while that of patients undergoing MRM was 52 years (range: 33–69 years). All patients underwent level I, II, and III clearance. Most of the patients presented in stage II in both the arms. Stage II was also the most common pathological stage. Fifty-one (82%) patients in the BCS arm and 64 patients (84%) in the MRM arm received adjuvant chemotherapy. All patients who underwent BCS received adjuvant radiotherapy, whereas 50 patients (66%) who had undergone MRM receive radiotherapy. Endocrine therapy was received by 36 patients (58%) in the BCS arm and 42 patients

| Table 1 Patient characteristics |
|--------------------------------|
| **Age (y)** | **BCS** | **MRM** |
| 31–40 | 9 | 4 |
| 41–50 | 30 | 22 |
| 51–60 | 19 | 42 |
| 61–70 | 4 | 8 |
| **cT stage** | | |
| T1 | 16 | 8 |
| T2 | 46 | 66 |
| T3 | 0 | 2 |
| **c N stage** | | |
| N0 | 37 | 30 |
| N1 | 25 | 46 |
| **Final histopathology** | | |
| Stage I | 12 | 4 |
| Stage II | 46 | 68 |
| Stage III | 4 | 4 |
| **Adjuvant chemotherapy** | | |
| Received | 51 | 64 |
| Not received | 11 | 8 |
| **Adjuvant radiotherapy** | | |
| Received | 62 | 50 |
| Not received | 0 | 26 |
| **Endocrine therapy** | | |
| Received | 36 | 42 |
| Not received | 26 | 34 |

Abbreviations: BCS, breast conservation surgery; MRM, modified radical mastectomy.
(55%) in the MRM arm. Both the groups were comparable at baseline (immediate presurgery), at 6 months, and at 1 year, respectively, except for the median age that was a decade younger in the BCS group. Table 2 depicts the baseline QOL scores of both the groups. Both the groups were well matched at baseline with no significant differences. QOL scores at 6 months are depicted in Table 3. BCS patients fared significantly better with respect to functional scales of physical functioning and body image. They also fared better with respect to symptom scales of dyspnea, fatigue, and appetite loss at 6 months postsurgery \((p < 0.05)\) (Figs. 1–3). The QOL of BCS versus MRM.

**Table 2** Comparison of QOL between BCS and MRM patients at baseline

| Scale                | Group | Mean  | SD    | \(p\)-Value |
|----------------------|-------|-------|-------|-------------|
| **EORTC QLQ C30**    |       |       |       |             |
| **Functional scales**|       |       |       |             |
| Physical functioning | BCS   | 83.55 | 16.23 | 0.409       |
|                     | MRM   | 81.14 | 17.60 |             |
| Role functioning    | BCS   | 88.44 | 19.23 | 0.094       |
|                     | MRM   | 82.46 | 21.92 |             |
| Emotional functioning| BCS   | 76.61 | 22.88 | 0.950       |
|                     | MRM   | 76.86 | 23.59 |             |
| Cognitive functioning| BCS   | 86.56 | 21.94 | 0.720       |
|                     | MRM   | 87.72 | 15.96 |             |
| Social functioning  | BCS   | 84.14 | 25.33 | 0.497       |
|                     | MRM   | 83.95 | 18.30 |             |
| **Symptom scales**   |       |       |       |             |
| Dyspnea             | BCS   | 6.45  | 14.58 | 0.083       |
|                     | MRM   | 11.84 | 21.57 |             |
| Pain                | BCS   | 11.56 | 16.96 | 0.056       |
|                     | MRM   | 18.42 | 23.50 |             |
| Fatigue             | BCS   | 16.67 | 22.65 | 0.192       |
|                     | MRM   | 21.64 | 21.77 |             |
| Sleep               | BCS   | 18.28 | 29.37 | 0.407       |
|                     | MRM   | 22.81 | 33.65 |             |
| Appetite loss       | BCS   | 11.83 | 25.68 | 0.832       |
|                     | MRM   | 10.96 | 22.04 |             |
| Nausea and vomiting | BCS   | 5.91  | 15.12 | 0.854       |
|                     | MRM   | 6.36  | 13.32 |             |
| Constipation        | BCS   | 11.29 | 23.33 | 0.935       |
|                     | MRM   | 10.96 | 23.34 |             |
| Diarrhea            | BCS   | 4.30  | 11.27 | 0.868       |
|                     | MRM   | 3.95  | 13.30 |             |
| Financial difficulties| BCS | 30.11  | 35.56 | 0.061       |
|                     | MRM   | 45.18 | 45.77 |             |
| Global health status QOL | BCS | 77.15  | 18.96 | 0.058       |
|                     | MRM   | 69.63 | 17.78 |             |

**Table 2 (Continued)**

| Scale                | Group | Mean  | SD    | \(p\)-Value |
|----------------------|-------|-------|-------|-------------|
| **EORTC QLQ BR23**   |       |       |       |             |
| **Functional scales**|       |       |       |             |
| Body image           | BCS   | 91.13 | 18.72 | 0.500       |
|                     | MRM   | 89.14 | 15.75 |             |
| Sexual functioning   | BCS   | 75.30 | 27.52 | 0.063       |
|                     | MRM   | 86.03 | 19.66 |             |
| Sexual enjoyment     | BCS   | 28.33 | 36.73 | 0.066       |
|                     | MRM   | 17.11 | 33.77 |             |
| Future prospective   | BCS   | 58.60 | 35.65 | 0.866       |
|                     | MRM   | 59.65 | 35.83 |             |
| **Symptoms scales**  |       |       |       |             |
| Systematic therapy side effects | BCS | 13.54  | 15.54 | 0.162       |
|                     | MRM   | 17.17 | 14.67 |             |
| Arm symptoms        | BCS   | 12.72 | 16.69 | 0.337       |
|                     | MRM   | 15.57 | 17.73 |             |
| Breast symptoms     | BCS   | 9.81  | 13.03 | 0.264       |
|                     | MRM   | 12.61 | 15.72 |             |
| Hair loss           | BCS   | 15.36 | 11.47 | 0.146       |
|                     | MRM   | 23.77 | 13.34 |             |

**Table 3** Comparison of QOL between BCS and MRM patients at 6 months

| Scale                | Group | Mean  | SD    | \(p\)-Value |
|----------------------|-------|-------|-------|-------------|
| **EORTC QLQ C30**    |       |       |       |             |
| **Functional scales**|       |       |       |             |
| Physical functioning | BCS   | 62.15 | 20.41 | 0.039       |
|                     | MRM   | 54.56 | 22.04 |             |
| Role functioning    | BCS   | 64.52 | 20.58 | 0.349       |
|                     | MRM   | 61.18 | 20.80 |             |
| Emotional functioning| BCS   | 57.93 | 16.76 | 0.759       |
|                     | MRM   | 58.92 | 20.23 |             |
| Cognitive functioning| BCS   | 80.11 | 18.81 | 0.351       |
|                     | MRM   | 76.97 | 20.18 |             |
| Social functioning  | BCS   | 41.67 | 20.85 | 0.788       |
|                     | MRM   | 40.57 | 25.87 |             |
| **Symptom scales**   |       |       |       |             |
| Dyspnea             | BCS   | 15.59 | 20.66 | 0.015       |
|                     | MRM   | 25.88 | 28.07 |             |
| Pain                | BCS   | 43.28 | 19.43 | 0.583       |
|                     | MRM   | 45.18 | 20.69 |             |

Abbreviations: BCS, breast conservation surgery; EORTC QLQ, European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire; MRM, modified radical mastectomy; QOL, quality of life; SD, standard deviation.
scores at 1 year are depicted in Table 4. At 1 year postsurgery, BCS patients fared better with respect to physical functioning, role functioning, global health status, body image, sexual enjoyment, and dyspnea, while post-MRM patients fared better in emotional functioning and future prospectives (p < 0.05) (►Table 4).

**Discussion**

QOL studies are an integral part of the multidisciplinary management of cancer patients. They provide a measure of...
the wholesome treatment that includes the social, psychological, and emotional aspects of the disease, apart from the physical aspect. QOL measures individual’s or group’s perceived physical and mental health over time. With the advent of newer treatments, breast cancer patients have an improved overall survival. This raises questions about the QOL in these patients most of who receive multimodality treatment. Breast surgery has a great impact on all aspects of a woman’s life. There are multiple studies on the impact of breast surgery on the QOL in Western population. The spectrum of breast cancer in India is different from that of the West. Patients are about one decade younger in developing countries like India than their counterparts in developed nations. Thus, the QOL issues of Indian women may be different from that of Western women. There are a few studies of QOL in breast cancer patients from Asia with contradictory results. Edib et al observed that women who underwent BCS had better global health status than women who had mastectomy. In contrast, Huang et al found that patients who had BCS had poorer global health status than those who had mastectomy. Other studies comparing BCS and mastectomy did not find associations with global health status or overall well-being.

Our study compares the QOL post-BCS and MRM immediate presurgery, at 6 months after surgery, and at 1 year after surgery. The median age of women in the BCS group was a decade younger than that of the MRM group. Both groups were comparable at baseline. A single-time measure of QOL carries a lesser value as compared with multiple measures over a period of time. Multiple measures help to study the change over time and to effectively compare between treatments. In our study, we have measured the QOL at three different time periods with respect to the surgery of breast cancer using the Malayalam version (local language) of the questionnaires. The same questionnaires were used in a similar Indian study in young breast cancer patients by Dubashi et al.

### Table 4 Comparison of QOL between BCS and MRM patients at 1 year

| Scale                        | Group   | Mean  | SD    | p-Value |
|------------------------------|---------|-------|-------|---------|
| **EORTC QLQ C30**            |         |       |       |         |
| Functional scales            |         |       |       |         |
| Physical functioning         | BCS     | 76.99 | 15.91 | 0.037   |
|                             | MRM     | 70.53 | 19.45 |         |
| Role functioning             | BCS     | 83.06 | 18.23 | 0.026   |
|                             | MRM     | 75.66 | 19.90 |         |
| Emotional functioning        | BCS     | 70.43 | 14.13 | 0.029   |
|                             | MRM     | 75.40 | 12.35 |         |
| Cognitive functioning        | BCS     | 89.25 | 14.81 | 0.057   |
|                             | MRM     | 83.99 | 16.77 |         |
| Social functioning           | BCS     | 56.72 | 15.23 | 0.907   |
|                             | MRM     | 57.02 | 14.47 |         |
| **Symptom scales**           |         |       |       |         |
| Dyspnea                      | BCS     | 3.76  | 10.64 | 0.449   |
|                             | MRM     | 5.26  | 12.24 |         |
| Pain                         | BCS     | 22.58 | 16.00 | 0.537   |
|                             | MRM     | 24.34 | 17.09 |         |
| Fatigue                      | BCS     | 21.68 | 18.04 | 0.126   |
|                             | MRM     | 26.61 | 19.21 |         |
| Sleep                        | BCS     | 15.59 | 19.76 | 0.492   |
|                             | MRM     | 26.61 | 19.21 |         |
| Appetite loss                | BCS     | 13.98 | 19.60 | 0.151   |
|                             | MRM     | 18.86 | 19.88 |         |
| Nausea and vomiting          | BCS     | 9.14  | 13.39 | 0.13    |
|                             | MRM     | 15.79 | 17.62 |         |
| Constipation                 | BCS     | 4.30  | 12.78 | 0.169   |
|                             | MRM     | 1.75  | 7.49  |         |
| Diarrhea                     | BCS     | 3.76  | 10.64 | 0.449   |
|                             | MRM     | 5.26  | 12.24 |         |
| Financial difficulties       | BCS     | 54.30 | 24.32 | 0.502   |
|                             | MRM     | 57.02 | 22.98 |         |
| Global health status QOL     | BCS     | 73.66 | 9.92  | 0.033   |
|                             | MRM     | 69.63 | 11.68 |         |

**EORTC QLQ BR23**

| Scale                        | Group   | Mean  | SD    | p-Value |
|------------------------------|---------|-------|-------|---------|
| Functional scales            |         |       |       |         |
| Body image                   | BCS     | 80.78 | 21.26 | <0.001  |
|                             | MRM     | 53.51 | 19.54 |         |
| Sexual functioning           | BCS     | 97.04 | 10.24 | 0.436   |
|                             | MRM     | 98.41 | 9.33  |         |
| Sexual enjoyment             | BCS     | 7.10  | 22.04 | 0.024   |
|                             | MRM     | 69.63 | 11.68 |         |
| Future prospective           | BCS     | 40.86 | 25.90 | <0.001  |
|                             | MRM     | 62.28 | 22.00 |         |

Abbreviations: BCS, breast conservation surgery; EORTC QLQ, European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire; MRM, modified radical mastectomy; QOL, quality of life; SD, standard deviation.
At 6 months postsurgery, BCS patients fared significantly better with respect to physical functioning, dyspnea, fatigue, appetite loss, and body image when compared with those undergoing MRM. At 1 year postsurgery, BCS patients fared better with respect to physical functioning, role functioning, dyspnea, global health, sexual enjoyment, and body image, while MRM patients fared better in emotional functioning and future perspectives.

The results as per the available literature are variable, with a few studies agreeing with our results, whereas others have pointed to the contrary. Dubashi et al found the QOL and sexual functioning to be marginally worse in the BCS group when compared with mastectomy group. In the study by Pandey et al, women undergoing MRM were found to have significant deterioration in physical and functional well-being, breast-specific subscale, trial outcome index, and overall QOL as compared with BCS. This study looked at a similar population and is in concordance with our study.

In breast cancer survivors, sometimes the only reminder of their malignancy is the mutilating scar on their chest. This logically leads to emotional distress and body image issues in all age groups. Patients undergoing BCS in our study tend to have a better body image of themselves as compared with patients undergoing MRM. An Egyptian study showed that women in MRM group had higher level of body image distress among cognitive, affective, and behavioral aspects. This is in concordance with other literature that has reported better perception of body image in patients undergoing BCS.

Interestingly, in our study, patients undergoing MRM have fared better than their BCS counterparts in terms of future perspective. Many studies have shown future perspective to be worse in MRM patients as compared with BCS patients. Our study results are in contradiction to these studies. The fear of recurrence in the residual breast and the younger age of the BCS group may contribute to such a finding. Numerous trials have proved the oncological similarity between the two procedures. Proper counseling goes a long way in allaying the fears of the patients undergoing breast conservation. Although we counsel our patients about the safety of BCS, probably better counseling is required.

Patients undergoing MRM have also fared better in terms of emotional functioning in our study. In contrast, Enien et al found that BCS patients fared better in emotional functioning compared with those undergoing MRM. Again, the younger age of the BCS patients in our study could contribute to this finding.

There are many drawbacks of our study. No data on socio-demographics and psychosocial factors were available that can have a significant impact on the QOL. The BCS group was a decade younger than the MRM group. This age difference may have contributed to some of the difference in QOL between the two groups. There is no data about the comorbidities that significantly affect the QOL. None of our patients underwent reconstructive surgery. Reconstruction after MRM improves the body image as compared with mastectomy alone. Details regarding ovarian ablation or suppression therapy, type of chemotherapy and impact of radiotherapy in QOL are not available.

Conclusions

Patients undergoing BCS fare better than patients undergoing MRM at 6 months and 1 year in terms of physical functioning, role functioning, and global health status. They tend to have a better perception of their body image and perform better in terms of various symptom scales. Patients undergoing MRM, in turn, tend to perform better in terms of future perspective and emotional functioning at 1 year. The choice of breast conservation should be offered to all patients if oncologically safe and cosmetically acceptable in early breast cancer even in developing countries.

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Note
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