

Original Article

Impact of Modified Radical Mastectomy on Health-related Quality of Life in Women with Early Stage Breast Cancer

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Abstract

Background: Systematic reviews favor a better body image and sexual activity in patients who have undergone conservative breast surgery (BCS) compared to modified radical mastectomy (MRM). In those patients with the same survival, MRM remains the surgical choice among both surgeons and patients in Iran as well as in many other countries. This cross-sectional study focuses on health-related quality of life in early stage breast cancer patients following BCS and MRM.

Methods: From all post-op patients who referred to the Motahari Clinic, Shiraz, Iran, we used a convenient sampling method to select 160 MRM patients and 127 who underwent BCS. Translated copies of the EORTC QLQ-C30 (version 3) and the EORTC QLQ-BR23 questionnaires, in addition to a third questionnaire which was customized and prepared for this study, were completed by the patients under our supervision.

Results: The two groups were compared by a multivariate method (Hotelling's trace test) after controlling for variables with unequal values such as disease stage, hormonal and radiotherapy treatments, and patients' role in the choice of surgery. We noted a significant difference ($P < 0.001$) attributed to a significantly better BI in the BCS group (average: 78.49 ± 23.14) compared to the MRM group (average: 60.71 ± 23.14).

Discussion: We concluded that in terms of body image, BCS has a better impact on health-related quality of life.

Keywords: Breast cancer, conservative breast surgery, health-related quality of life, modified radical mastectomy

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Introduction

Evaluation of health-related quality of life (HRQOL) is important in chronic diseases; it is a better indicator of patients' function and well-being compared to the physicians' clinical and para-clinical indices.¹ HRQOL is important in the field of oncology since, according to recent advancements, patient survival is no longer the sole issue.² According to recent studies, HRQOL is now second only to survival.³

Breast cancer is a common chronic disease⁴ that negatively impacts women in their productive years of life.⁵ Although conservative breast surgery (BCS) is said to have a better effect on body image (BI) and sexual activity,⁶ its predecessor, the modified radical mastectomy (MRM) is preferred by both patients and surgeons⁷ in Iran as well as other countries,⁸ yet it has not been proven to affect survival any more than BCS.^{9,10}

We were unable to locate any document that surveyed HRQOL in women who underwent MRM or BCS in Iran. Therefore, this

study has evaluated HRQOL and its impact on in women with breast cancer who underwent either MRM or BCS. The results of this study intend to enable better decision making for both surgeons and patients.

Materials and Methods

From all post-op patients who referred to the Motahari Clinic, a referral clinic at Shiraz University of Medical Sciences (SUMS), Shiraz, Iran, we included 160 post-op patients who underwent modified radical mastectomy (MRM) and 127 patients who underwent conservative breast surgery (BCS) in this cross-sectional study. Sampling was by the "convenience method". Inclusion criteria were as follows: i) stages I, II, and IIIa breast cancer; ii) at least six months after the last treatment (surgery, radiotherapy, or chemotherapy) in order to avoid acute treatment effects; iii) less than five years since diagnosis; iv) patient compliance; and v) ability to speak and comprehend Farsi. Exclusion criteria were disease recurrence and evidence of any other (than breast cancer) or psychiatric disease.

Translated copies of the EORTC QLQ-C30 (version 3) and EORTC QLQ-BR23 questionnaires, with approved reliability and validity of both original and translated copies, were used in this study.^{11,12} Other requested data such as age, education, marital status, number of children, elapsed time since surgery, and patients' active role in selecting type of intervention were all asked in a customized questionnaire prepared for this study. Questionnaires

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Table 1. Demographic characteristics of breast cancer patients by surgical treatment group.

Characteristics		MRM † n = 160	BCS ‡ n = 127
Age (yr), mean (SD)		48.90 (10.45)	46.98 (10.82)
Education (%)	University	11.3	14.2
	Diploma	38.1	48.0
	Under diploma	31.9	28.2
	Illiterate	18.8	9.4
Marital status (%)	Married	84.4	76.4
	Single	10.6	18.1
	Widowed	5.0	4.7
Number of children	Zero	13.8	19.7
	One to three	41.3	40.2
	Four or more	45.0	40.2
Active role in selecting type of intervention*	Yes	54.4	70.9
	No	45.6	29.1

†MRM = modified radical mastectomy; ‡ BCS = breast conservation surgery; * Significantly different at $P < 0.05$.

Table 2. Medical characteristics of breast cancer patients by surgical treatment group.

Characteristic		MRM † n = 160	BCS ‡ n = 127
Time since surgery (months, median range)		23 (6–60)	19 (6–60)
Disease stage*	I	19.4	31.5
	II	71.9	65.4
	IIIa	8.8	3.1
Radiotherapy* (%)	Yes	21.3	100
	No	78.8	0
Chemotherapy* (%)	Yes	98.8	99.2
	No	1.2	0.8
Hormonal therapy*(%)	Yes	76.2	65.4
	No	23.8	34.6

† MRM = modified radical mastectomy; ‡ BCS = breast conservation surgery; *Significantly different at $P < 0.05$.

were self-administered. Additional data such as cancer stage, other therapies (i.e., chemotherapy, radiotherapy, and hormonal therapy) were extracted from the patients' charts obtained from the Motahari Clinic archives.

Data was processed by SPSS (version 11.5). We used the following statistical tests: chi-square, Mann-Whitney U, Kruskal-Wallis H, ANCOVA, multivariate (Hotelling's trace), and multiple regression analysis. P -values less than 0.05 were considered significant.

Results

Patients' average age in the MRM group was 48.90 ± 10.45 years compared with 46.98 ± 10.82 years in the BCS group. The shortest time interval since surgery was six months in the MRM group and the longest interval was 60 months (mean: 23 months) in this group. In the BCS group, the shortest time interval since surgery was six months and the longest time since surgery was 60 months (mean: 19 months). Tables 1 and 2 list demographic values and individualized information on disease and treatment. The two study groups were not equal in terms of variables such as disease stage, radiotherapy, hormonal therapy, and patient's role in choosing the type of surgery.

Due to the lack of interest from patients in answering questions regarding sexual activity (18.46%) and a single question, which inquired about sexual satisfaction (56.44%), we omitted these items from the data. Additionally, due to the 73.86% negative response to the question regarding hair loss, it was also omitted. Among the 7 practical aspects and 12 items dedicated to patient complaints, with the exception of a single question about general life quality, women in the BCS group scored better in terms of role playing, fatigue, nausea and vomiting, pain, dyspnea, insomnia, and general quality of life (Table 3). Despite this, ANCOVA-controlled variables showed no such difference in quality of life outcomes ($P = 0.183$). On the other hand, according to the multivariate method (Hotelling's trace test) a meaningful difference was noted ($P < 0.001$) that was attributed to a significantly better BI in the BCS group (average: 78.49 ± 23.14) compared to the MRM group, whose average was 60.71 ± 23.14 . To a lesser extent, this was also attributed to the lower rate of fatigue (BCS: 19.11 ± 15.12 vs. MRM: 18.55 ± 21.27) and fewer complaints regarding lymphedema (BCS: 28.30 ± 17.14 vs. MRM 37.43 ± 17.14 ; Table 3). Multiple regression analysis showed that the time since surgery was the only independent variable that affected quality of life in our patients ($P = 0.041$; Table 4).

Table 3. EORTC QLQ-C30 and EORTC QLQ-BR23 scores among women who received MRM and BCS.

	MRM† (mean ± SD)	BCS‡ (mean ± SD)
Scores on EORTC QLQ-C30†		
Global health status	56.97 ± 17.78	66.22 ± 12.59
Physical functioning	79.66 ± 13.70	81.12 ± 10.85
Role functioning	87.55 ± 16.68	93.59 ± 12.04
Emotional functioning	56.28 ± 20.99	58.50 ± 20.08
Cognitive functioning	95.24 ± 15.37	96.80 ± 11.54
Social functioning	87.98 ± 18.38	91.79 ± 14.37
Fatigue symptoms	18.55 ± 21.27	9.11 ± 15.12
Nausea and vomiting	4.19 ± 13.22	1.67 ± 8.26
Pain symptoms	20.26 ± 23.56	12.25 ± 14.41
Dyspnea	2.06 ± 8.82	0 ± 0
Insomnia	16.32 ± 24.37	7.03 ± 17.04
Appetite	9.91 ± 20.25	8.57 ± 15.67
Constipation	4.74 ± 13.26	8.06 ± 17.54
Diarrhea	1.85 ± 9.25	.295 ± 2.92
Financial difficulties	27.18 ± 26.64	21.30 ± 16.90
Scores on EORTC QLQ-BR23†		
Body image	60.71 ± 23.14	78.49 ± 18.38
Future perspective	31.69 ± 30.00	30.90 ± 27.99
Systemic therapy side effect	20.46 ± 19.96	15.59 ± 14.60
Breast symptoms	18.71 ± 16.62	16.48 ± 15.58
Arm symptoms	37.43 ± 23.41	28.30 ± 17.14

† = standard scores (0–100) are presented for each scale of the EORTC QLQ-C30 and QLQ-BR23. Higher scores represent higher/healthy level of functioning and quality of life, whereas higher scores for the symptoms indicate a higher level of the problem. †MRM = Modified radical mastectomy; ‡BCS = Breast conservation surgery; *Significantly different at $P < 0.05$.

Table 4. Coefficient of regression model for variables that predict health-related quality of life (HRQOL) on women who received treatment for early stage breast cancer.

Variables	B	SE (B)†	P-value
Age	-0.036	0.096	0.708
Widowed	7.44	5.47	0.175
Married	7.26	3.68	0.05
Number of children	-2.25	1.82	0.217
Education	0.504	1.176	0.669
Stage of disease	0.572	1.80	0.751
Radiotherapy	5.04	3.04	0.099
Chemotherapy	1.85	9.15	0.840
Hormonal therapy	-3.52	2.07	0.090
Active role in selecting type of intervention	0.372	1.97	0.851
Time since surgery	0.120	0.058	0.041*
Type of surgery	5.28	3.11	0.091

† = Standard error of β ; *: $P < 0.05$ indicates statistical significance.

Discussion

Without controlling for factors that differed between the two groups (Tables 1 and 2), women who experienced BCS had better global health status (66.22 ± 12), role functioning (93.59 ± 12.0), and BI (78.49 ± 18.38) compared to the MRM group who had a global health status of 56.97 ± 17.78 , role functioning of 87.55 ± 16.68 , and BI of 60.71 ± 23.14 . Patients who underwent MRM suffered from fatigue (18.55 ± 21.27), nausea and vomiting (4.19 ± 13.22), pain (20.26 ± 23.56), dyspnea (2.06 ± 8.82), insomnia (16.32 ± 24.37), and arm symptoms (37.43 ± 23.41) more than patients in the BCS group. Patients in the BCS group had the following values for fatigue (11 ± 15.12), nausea and vomiting (1.67 ± 8.26), pain (12.25 ± 14.41), dyspnea (0 ± 0), insomnia (7.03 ± 17.04), and arm symptoms (28.30 ± 17.14).

Based on Middle Eastern culture, women's refusal to reply to questions regarding their sexual lives was quite expected. Fung and colleagues had the same problem in their study where Chinese women over the age of 50 thought they were too old to have a sex life and younger women were too shy to answer questions pertaining to their sex lives.¹³ To overcome this issue, these researchers used a qualitative in-depth interview to obtain the answers they needed, yet with respect to Chinese women's beliefs. These solutions seemed to be useful in similar fields of study on Iranian

women.

Because of the considerable negative response to hair loss (73.86%), we concluded that this matter was not a major problem for our patients. Our second inclusion criteria required that patients must have completed their final treatment at least six months prior to enrollment in this study, therefore we did not enroll patients with acute symptoms such as hair loss. We attributed the negative response to hair loss to our inclusion criteria.

However, the two groups were similar in terms of age, education, marital status, and number of children. Additionally, the meaningful difference between the two groups on general quality of life and its aspects with regards to the sampling method was not credible. After controlling for disease stage, radiotherapy, chemotherapy, hormonal therapy, and patient's role in choice of surgery by ANCOVA, no meaningful difference was noted. These findings were also endorsed by other similar studies.¹⁴⁻¹⁷

Most studies favor the multidimensional nature of HRQOL.¹⁸ Thus, multivariable methods are more suitable. In this case, according to Hotelling's trace test we have noted a meaningful difference that was mostly attributed to a better BI in the BCS group, a conclusion which has been supported by numerous other studies.¹⁹⁻²²

Time seems to be the only predicting factor on HRQOL, and its significant role has been discussed by other studies regarding pa-

tients' comprehension of their quality of life. As in the gap theory by Calman, quality of life is defined as "an inverse relationship between one's expectations and their perception of the given situation, the smaller the gap, the better the quality of life".²³ With passing time, usually one's expectations become more realistic and this gap begins to shrink. This fact has been stated in separate studies by Parker et al. and Ganz et al.^{24,25}

Cohen and colleagues have studied women who underwent BCS after 40 months and surprisingly found that the patients' conditions regressed over time.²⁶ The researchers have attributed this observation to the fact that the remaining, initially disease-free breast causes the patient to fear disease recurrence, which does not resolve through time. They have concluded that the consultation for decision making must be based on long-term potentially positive and negative effects of the procedure. Due to the characteristic differences in our study, we were unable to reach the same conclusion.

These studies on Iranian women seem to be undeniably necessary for today's Iranian society. A limitation of this study is that the results are not absolutely error-free, mainly due to the sampling method.

References

- Guyatt GH, Thompson PJ, Berman LB, Sullivan MJ, Townsend M, Jones NL, et al. How should we measure function in patients with chronic heart and lung disease? *J Chron Dis*. 1985; **38**: 517–524.
- Kuroi K, Shimozuma K, Ohsumi S, Imai H, Ono M. Current status of health outcome assessment of medical treatment in breast cancer. *Breast Cancer*. 2007; **14**: 74–80.
- Shimozuma K, Imai H, Kuroi K, Ohsumi S, Ono M. Recent topics of health outcomes research in oncology. *Breast Cancer*. 2007; **14**: 60–65.
- Perry S, Kowalski TL, Chang CH. Quality of life assessment in women with breast cancer: benefits, acceptability, and utilization. *Health Qual Life Outcomes*. 2007; **5**: 24.
- Hadi N, Sadeghi-Hassanabadi A, Talei AR, Arasteh MM, Kazerooni T. Assessment of a breast cancer screening program in Shiraz, Islamic Republic of Iran. *East Mediter Health J*. 2002; **8**: 386–392.
- Montazeri A. Health-related quality of life in breast cancer patients: a bibliographic review of the literature from 1974 to 2007. *J Exp Clin Cancer Res*. 2008; **27**: 32.
- Kotwall CA, Covington DL, Rutledge R, Churchill MP, Meyer AA. Patient, hospital, and surgeon factors associated with breast conservation surgery. A statewide analysis in North Carolina. *Ann Surg*. 1996; **224**: 419–429.
- Najafi M, Ebrahimi M, Kaviani A, Hashemi E, Montazeri A. Breast conserving surgery versus mastectomy: cancer practice by general surgeons in Iran. *BMC Cancer*. 2005; **5**: 35.
- Fisher B, Anderson S, Redmond CK, Wolmark N, Wickerham DL, Cronin WM. Reanalysis and results after 12 years of follow-up in a randomized clinical trial comparing total mastectomy with lumpectomy with or without irradiation in the treatment of breast cancer. *N Engl J Med*. 1995; **333**: 1456–1461.
- Poggi MM, Danforth DN, Sciuto LC, Smith SL, Steinberg SM, Liewehr DJ, et al. Eighteen-year results in the treatment of early breast carcinoma with mastectomy versus breast conservation therapy: the National Cancer Institute Randomized Trial. *Cancer*. 2003; **98**: 697–702.
- Aaronson NK, Ahmedzai S, Bergman B, Bullinger M, Cull A, Duez NJ, et al. The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst*. 1993; **85**: 365–376.
- Montazeri A, Harirchi I, Vahdani M, Khaleghi F, Jarvandi S, Ebrahimi M, et al. The EORTC breast cancer-specific quality of life questionnaire (EORTC QLQ-BR23): translation and validation study of the Iranian version. *Qual Life Res*. 2000; **9**: 177–184.
- Fung KW, Lau Y, Fielding R, Or A, Yip AW. The impact of mastectomy, breast-conserving treatment, and immediate breast reconstruction on the quality of life of Chinese women. *ANZ J Surg*. 2001; **7**: 202–206.
- Wapnir IL, Cody RP, Greco RS. Subtle differences in quality of life after breast cancer surgery. *Ann Surg Oncol*. 1999; **6**: 359–366.
- Caffo O, Amichetti M, Ferro A, Lucenti A, Valduga F, Galligioni E. Pain and quality of life after surgery for breast cancer. *Breast Cancer Res Treat*. 2003; **80**: 39–48.
- Janni W, Rjosk D, Dimpfl TH, Haertl K, Strobl B, Hepp F, et al. Quality of life influenced by primary surgical treatment for stage I-III breast cancer-long-term follow-up of a matched-pair analysis. *Ann Surg Oncol*. 2001; **8**: 542–548.
- Pandey M, Thomas BC, Ramdas K, Ratheesan K. Early effect of surgery on quality of life in women with operable breast cancer. *Jpn J Clin Oncol*. 2006; **36**: 468–472.
- Manning-Walsh J. Social support as a mediator between symptom distress and quality of life in women with breast cancer. *J Obstet Gynecol Neonatal Nurs*. 2005; **34**: 482–493.
- Nano MT, Gill PG, Kollias J, Bochner MA, Malycha P, Winefield HR. Psychological impact and cosmetic outcome of surgical breast cancer strategies. *ANZ J Surg*. 2005; **75**: 940–947.
- Curran D, van Dongen JP, Aaronson NK, Kiebert G, Fentiman IS, Mignolet F, et al. Quality of life of early-stage breast cancer patients treated with radical mastectomy or breast-conserving procedures: results of EORTC Trial 10801. *Eur J Cancer*. 1998; **34**: 307–310.
- Cohen L, Hack TF, de Moor C, Katz J, Goss PE. The effects of type of surgery and time on psychological adjustment in women after breast cancer treatment. *Ann Surg Oncol*. 2000; **7**: 427–434.
- Carr AJ, Gibson B, Robinson PG. Measuring quality of life: is quality of life determined by expectations or experience? *BMJ*. 2001; **322**: 1240–1243.
- Kaasa S, Loge H. Quality of life in palliative medicine-principle and practice. In: Doyle D, Hanks G, Cherny NI, Calman K, eds. *Oxford Textbook of Palliative Medicine*. 3rd ed. New York: Oxford University Press; 2005: 197.
- Parker PA, Youssef A, Walker S, Basen-Engquist K, Cohen L, Gritz ER, et al. Short-term and long-term psychosocial adjustment and quality of life in women undergoing different surgical procedures for breast cancer. *Ann Surg Oncol*. 2007; **14**: 3078–3089.
- Ganz PA, Schag AC, Lee JJ, Polinsky ML, Tan SJ. Breast conservation versus mastectomy. Is there a difference in psychological adjustment or quality of life in the year after surgery? *Cancer*. 1992; **69**: 1729–1738.
- Cohen L, Hack TF, de Moor C, Katz J, Goss PE. The effects of type of surgery and time on psychological adjustment in women after breast cancer treatment. *Ann Surg Oncol*. 2000; **7**: 427–434.