

Original Research Article

Comparative study between breast conservative surgery and modified radical mastectomy in early stage of breast carcinoma in a tertiary care hospital

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ABSTRACT

Background: Breast cancer is the most prevalent cancer in women globally, with two million new cases and more than half a million deaths each year. Surgery is the key component of treating breast cancer and there are two primary types of breast surgery available: breast conservative surgery and modified radical mastectomy. The aim of this study was to compare BCS and MRM in the treatment of early-stage breast carcinoma.

Methods: This was a prospective observational study that involved 74 patients and was carried out in the Department of Surgery at Shaheed Suhrawardy Medical College & Hospital and Enam Medical College & Hospital with an 18-months minimum follow-up. The time frame for inclusion was from July 2018 through July 2020. There were two patient groups, 37 patients in Group A who underwent breast conservative surgery and Group B was made up of 37 individuals who had MRM for early-stage breast carcinoma.

Results: With a mean age of 47.65 years in the BCS group and 48.19 years in the MRM group, the operative time for BCS was 1.04±0.25 hours, whereas 3.20±0.48 hours for MRM. Statistically significant higher amount of post-operative drainage volume in MRM group compared to BCS group (p value=0.000). With an excellent aesthetic outcome rate in BCS group (p value<0.0001) as well as better quality of life than MRM group.

Conclusions: Breast conservative surgery and modified radical mastectomy are both oncologically safe treatments for early-stage breast cancer with multidisciplinary approach. BCS offers less trauma, infection and hospital stay; better aesthetic outcome and quality of life than MRM, making it more deserving of being promoted clinically in the treatment of early-stage breast cancer.

Keywords: Breast cancer, Breast conservative surgery, MRM

INTRODUCTION

Breast cancer is the most prevalent cancer in women globally, with two million new cases and more than half a

million deaths each year.¹ Among the several stages, early stage of breast cancer implies- any form that has not spread beyond the breast tissue or the local lymph nodes. Surgery is a crucial component of treating breast cancer and there

are two primary types of breast surgery available for early-stage disease: breast conservative surgery (BCS) and modified radical mastectomy (MRM). In terms of complication rates, hospital stay duration, recovery time, patient-reported symptoms, body image, and quality of life are different between BCS and MRM.^{2,3} The modified radical mastectomy, first proposed by Meyer and Halsted in 1894, was commonly used in the past for surgical treatment of breast cancer. Since then, modified radical mastectomy, which results in essentially no difference in survival rates but greatly minimizes morbidity, has been used often. Conservative surgery is now a well-recognized option to mastectomy for the treatment of early-stage breast cancer. After the publication of three separate research articles in the 1980s stating that patients, undergoing breast conservative surgery versus radical mastectomy did not experience any differences in survival or outcome rates.⁴⁻⁹ However, According to certain additional studies, MRM and breast-conservative surgery have similar outcomes in terms of survival outcome.^{10,11} Some studies deliver evidence encouraging the use of BCS, but it remains unclear why such survival differences would exist.¹²⁻¹⁵ For example, Breast carcinoma is less common in women with a lower socioeconomic status, which in turn is associated with multimorbidity, a more advanced stage at presentation, lower rates of adjuvant chemotherapy and worse survival.¹⁶⁻²² Numerous prospective long-term studies on quality of life following breast surgery conducted in HICs have demonstrated that patients undergoing breast conservative surgery have higher body image-related QOL scores than those undergoing modified radical mastectomy. Being a more involved procedure, a mastectomy is anticipated to have a negative impact on QOL.^{23,24}

Aim and objectives

The aim of this study was to compare breast conservative surgery and modified radical mastectomy in early-stage breast carcinoma.

METHODS

This prospective observational study involved those patients with aged between 20-70 years, breast cancer at an early stage & able to undergo surgery and Patients with metastatic or locally advanced breast cancer, previous chest wall Irradiation, involvement of the breast skin, Patient refusal, recurrent breast cancer and pregnant women were excluded from this study. The study was carried out at the Surgery departments at Shaheed Suhrawardy medical college & hospital and Enam Medical College & Hospital with an 18-month minimum follow-up. The time frame for inclusion was from July 2018 through July 2020. A number of total 74 patients were selected and there were two patient groups, 37 patients in Group A who underwent breast conservative surgery and Group B was made up of 37 individuals who had MRM for breast carcinoma. Patients with small tumor size, favorable breast-tumor ratio, unifocal tumor, no contra-

indication for radiation- were selected for BCS. Whereas, patients with small breast/large tumor, multifocal tumor, central tumor, having lymph node involvement only, patient choice- were selected for MRM. We diagnosed the patient through triple assessment- Complete history; Complete clinical examination, including entire breast examination and relevant imaging modalities. The patients more than 35 years of age were imaged by mammogram whereas less than 35 years by Ultrasonogram. Patient whose mammogram or USG found inconclusive, were sent for fine needle aspiration cytology (FNAC) to confirm the diagnosis. MRI was used in cases with lobular carcinoma and when mammography was inconclusive. Then staging was done by CT scan and distant metastasis was excluded by PET-CT scan. Then pre-operative base-line investigations (i.e., Complete blood count, random blood sugar, serum creatinine, Chest X-ray, ECG, Blood grouping with Rh-typing) were done. Postoperative "endocrine therapy+ chemotherapy+conformal radiotherapy" was given to all applicable patients. Specific treatment regimen was selected according to St. Gallen Breast cancer consensus. Endocrine therapy involved giving premenopausal patients who had positive results for the estrogen receptor (ER) and progesterone receptor (PR) tamoxifen twice daily for five years, and postmenopausal patients who had positive results for both the ER and the PR letrozole once daily at a dose of 2.5 mg for five years. Furthermore, herceptin was administered to patients with human epidermal growth factor receptor-2 (HER-2) (beginning with an initial dose of 8 mg/kg intravenously for about 90 minutes, then lowering to 6 mg/kg every week for consecutive 12 months). In case of neoadjuvant chemotherapy, they treated with standard regimen. Breast conformal radiation was administered to those patients one month after surgery at a dose of 45-50 Gy to the whole breast and 10 Gy to the tumor bed.

Follow up was conducted through multi-disciplinary approach post-operatively at six months interval up to 18 months in an out-patient department (OPD) basis. The follow-up scheme was consisted with breast examination, clinical examination at OPD, ultrasonography & tumour marker. At the end of one year & two year post-operatively assessment of quality of life (QoL) was done by using quality of life questionnaire. Here, social functioning, body image and sexual function were assessed. After one year of surgery, aesthetics outcome was evaluated using Harris's 4-staged subjective evaluation method. The software SPSS 20.0 for Windows (SPSS Inc., Chicago, Illinois, USA) was used to generate all statistics. The Shapiro-Wilk test has been used to determine whether the numerical variables are suitable for normal distribution. The arithmetic mean and standard deviation are the statistics used to illustrate numerical variables and numerical values and percentages have been used to translate verbal outcomes into numerical values. An independent sample t-test has been performed to compare the two groups in terms of numerical variables. By utilizing the Pearson Chi-square and accepting the value of

p<0.05, verbally articulated variables have been further investigated.

RESULTS

Demographic and clinical characteristic

In the age distribution of the study patients, the mean±SD of the breast conservative surgery group was 47.65±11.25, and the MRM group was 48.19±11.96. The mean±SD of the tumor size was 1.21±0.78 cm in the group receiving breast conservative surgery. Tumor size was 2.22±0.93 cm on average in the group that underwent MRM. There was no statistically significant difference in tumor size between the two groups (p=0.431). There was no statistically significant difference between the groups in age, menopause, onset time and tumor size (p=0.842, 0.871, 0.632 & 0.431 respectively). In the BCS group, most 23 patients had UOQ lesion site, whereas 21 patients in MRM group. There was a statistically insignificant between the groups (p=0.816) (Table 1).

Table 1: Demographic and clinical characteristic of the study patients.

Variable	BCS group	MRM group	P value
Age (years) Mean±SD	47.65±11.25	48.19±11.96	0.842
Menopause (N)	14 (37.8%)	17 (45.9%)	0.871
Onset time (month)	10.13±4.12	11.32±4.41	0.632
Tumor size (cm)	1.21±0.78	2.22±0.93	0.431
Lesion Site			
UOQ	23	21	0.816
LOQ	4	3	
UIQ	8	6	
LIQ	4	5	

Immunohistochemistry and disease stage

The majority of 20 patients had the ER (+) in the BCS group and whereas 22 had it in the MRM group. PR (+) had 20 cases in the breast conservative surgery group and 22 in the MRM Group. HER-2 (+) had 2 cases in the BCS group and 3 in the MRM Group. There was no difference between the groups regarding immunohistochemistry of the study patients. The majority of 12 patients had the T2N0 stage of tumor in the BCS group and whereas 13 had it in the MRM group. T1N2 stage had 11 cases in the BCS group and 14 in the MRM group. There was no difference between the group regarding disease stage (p value=0.730) (Table 2).

Histopathological types

Most of the patients had Infiltrating duct carcinoma in both groups; 32 were in BCS group and 31 were in the MRM

group. There was no statistically significant difference between the groups (p=0.737) (Table 3).

Table 2: Immunohistochemistry & Disease stage of the study groups.

Immunohistochemistry & disease stage	Surgery type		P value
	BCS Group	MRM Group	
ER (+)	20	22	0.67
PR (+)	20	22	0.98
HER-2 (+)	2	3	0.730
T1N0	7	6	0.730
T2N0	12	13	
T1N1	7	4	
T1N2	11	14	
Total	37	37	

Table 3: Histopathological types of the study groups.

Histopathological types	Surgery type		P value
	BCS Group	BCS Group	
Infiltrating DICS	32	31	0.737
Medullary carcinoma	5	6	
Total	37	37	

Table 4: Intraoperative and post-operative finding of the study group.

Variables	Surgery type	N	Mean±SD	P value
Operative time (hours)	BCS	37	1.04±0.25	0.000
	MRM	37	3.20±0.48	
Drainage volume (ml)	BCS	37	82.08±29.2	0.000
	MRM	37	200.08±49.2	
Hospital stay (days)	BCS	37	09±1.39	0.000
	MRM	37	13±2.72	

Intraoperative and post-operative findings

In the group with breast conservative surgery, the mean±SD of the operating time was 1.04±0.25 hours, whereas, in the group receiving MRM, it was 3.20±0.48 hours. The length of the operation differs statistically significantly between the two groups, with group MRM taking longer than breast conservative surgery (p value=0.000). In the group with breast conservative surgery, the mean±SD of the postoperative drainage volume was 82.08±29.20 ml, whereas, in the group receiving MRM, it was 200.08±49.20 ml. There is a sizable statistical difference between the two groups regarding the postoperative drainage volume, with the group receiving MRM having a higher volume than the group receiving breast conservative surgery. In relation to the hospital stay, the postoperative hospital stay in both groups differs statistically significantly, with the MRM

group's stay being more extended than the group receiving BCS (p value=0.000) (Table 4).

Postoperative complications

Immediate wound complications included in this study were seroma formation, hematoma, flap necrosis and wound infections. Postoperative seroma occurred only in 12 cases out of 74, where 8 cases of MRM versus 4 cases of breast conservative surgery. Two patients were affected by haematoma in the BCS group and 4 in the MRM. Flap necrosis was not found in BCS group but 2 in the MRM group. One patient in the conservative surgery group had wound infection compared to 2 patients in the MRM group. Comparing these groups by the Pearson Chi-square test, the p value came as 0.747, which was statistically insignificant (Table 5).

Table 5: Short term postoperative complications results.

Complications	Surgery type		P value
	Conservative surgery	MRM group	
Seroma	4	8	0.747
Haematoma	2	4	
Flap necrosis	0	2	
Wound infection	1	2	
Total	07	16	

Recurrence rate analysis

The surgical and oncology teams had been routinely monitoring all patients after intervention. Follow up was done post-operatively at six months interval up to 18 months in an out-patient department (OPD) basis. In our analysis, only one patient experienced local recurrence in BCS group which occurred 18 months after the initial surgery. In MRM, there was no recurrence. In terms of recurrence, there was no statistical difference between the two groups (p=0.512) (Table 6).

Table 6: Recurrence rate of the study groups.

Recurrence	Surgery type		P value
	Conservative surgery	MRM group	
No	36	37	0.512
Yes	1	0	
Total	37	37	

Aesthetic outcome comparison

Regarding aesthetic outcomes, the excellent and good rates in the BCS Group were much higher than those in the MRM Group (91.90% vs. 0.0%, p<0.0001) (Table 7).

Post-operative quality of life assessment

At one- and two-year post-operative follow up, the status of social functioning, Body image and Sexual function were much better and favorable in BCS group than MRM group (p value<0.001, <0.0001 and <0.05 respectively) (Figure 1-3). Comparison of postoperative QoL at one and two years postoperatively, social functioning: Compared with the MRM group, p<0.001, Body image: Compared with the MRM group, p<0.0001; Sexual functioning: Compared with the MRM group, p<0.05.

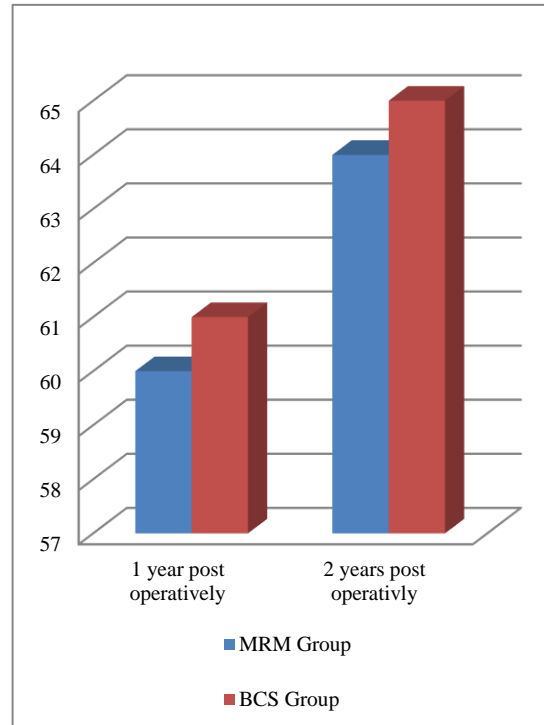


Figure 1: Social functioning.

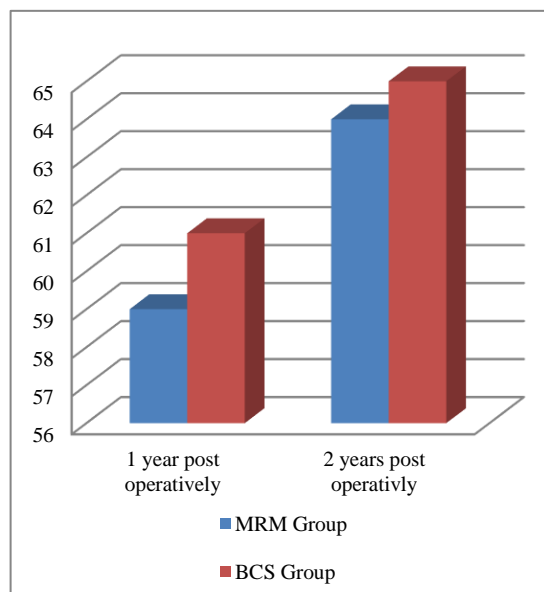


Figure 2: Body image.

Table 7: Comparison of aesthetic outcomes between the study groups.

Group	Excellent	Good	Fair	Poor	Excellent and good rate
MRM group (%)	0	0	0	100	0.00
BCS group (%)	30	4	2	1	91.90
P value					<0.0001

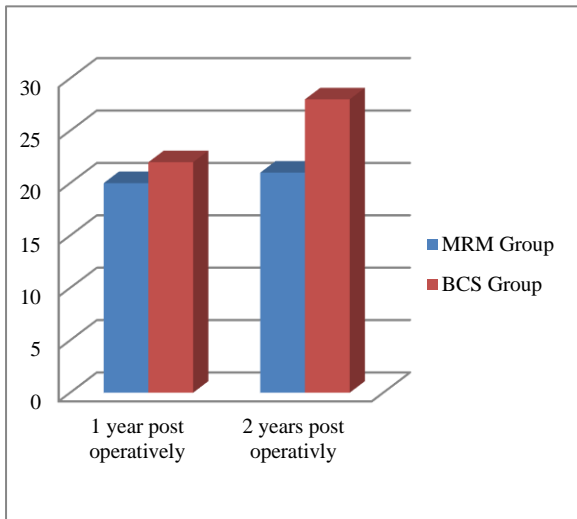


Figure 3: Sexual function.

DISCUSSION

Breast cancer is the most prevalent carcinoma in women and has historically been the leading cause of cancer-related death in females. Even with recent advancements in surgery, diagnosis, and screening, much improvement is still needed.²⁵

According to landmark trials, breast conservative surgery and modified radical mastectomy give comparable survival rates and can be seen as equivalent therapies in early-stage breast cancer.¹² Recent advancements in breast cancer surgery have focused on three key areas: patient recovery, oncological safety and the best possible cosmetic result.²⁶ In our study, we split the study population into two groups and examined the effectiveness of MRM against BCS in managing early stage breast carcinoma. Regarding the patients' ages, there was no statistically significant difference between the two groups in our study, with the mean ages of the groups undergoing BCS and MRM being 47.65 years and 48.19 years, respectively. This was considerably younger than the 53-year-old mean age of the patients who took part in the Mansell et al investigation.²⁷ In specific investigations, such as the one done by Tenofsky et al where the mean age was 60.9 years, the mean age was also more significant. In the 2011 study by Gennaro et al., the mastopexy group's average patient age was 53.3 years.^{28,29} In terms of surgical time, hospital stay, postoperative drainage volume, postoperative complications and cosmetic success as measured by patient and surgeon's satisfaction, there was a significant statistical difference in both groups. These are comparable

to the following studies: Concerning the length of the operation, our study found that the group mastectomy took an average of 3.20 hours compared to the group breast conservative surgery's mean of 1.04 hours. In a study of 18 patients, Lambert and Mokbel observed that the MRM group's mean operating duration was 3 hours (with a range of 188-191 minutes). In a study of 82 patients, Wang et al found that the MRM group's average operating duration was 2.5 hours (80-190 minutes).^{30,31} Operation times tend to be shorter in specialist high-volume centers and depend on the operating surgeon's skills. In our study, we found that the average hospital stay was 9.0 days for breast conservative surgery and 13.0 days for MRM group. According to Wang et al research's on postoperative problems, 10.2% (10/82) of the 82 individuals who underwent MRM overall experienced issues: Infection at the wound site occurred in two individuals; one patient had flap necrosis, three had seroma, and four had wound dehiscence. According to Rezaei out of 118 patients who underwent BCS, only four patients (or 3.3%) suffered wound infections, while 27 patients (or 22.8%) had seroma.^{31,32} Patients in our study have occasionally run into complications. Four patients who underwent BCS developed seroma, 2 had hematomas and one had wound infection, there was no incidence of flap necrosis in this group. Eight patients who underwent MRM had seroma; four experienced Haematoma, two had a wound infection and two suffered flap necrosis. There was one instance of recurrence in our study. In our analysis, the recurrence rate was only 1.35% with 1 case. The recurrence rate following MRM with a median of 192 months of follow-up was reported to be 1.04% by Lhenaff et al.³³ In a median follow-up of 30 months, Lim et al observed a local recurrence rate of 2% Post-BCS.³⁴

Limitations

This study has got some limitations. The sample size of the study was relatively small. Post-operative follow-up period was shorter. Also, the QoL was assessed by questionnaire survey, only after the surgery.

CONCLUSION

In conclusion BCS and MRM both are oncologically safe treatment option for early-stage breast carcinoma with a multi-disciplinary approach. BCS offers less trauma, infection and hospital stay; better aesthetic outcome and quality of life than MRM. Therefore, making it more deserving of being promoted clinically in the treatment of early-stage breast cancer.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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