OPEN ACCESS ORIGNAL ARTICLE

OUTCOMES OF MODIFIED RADICAL MASTECTOMY MRM VS BREAST CONSERVATION SURGERY BCS.

Saadia Muhammad[1], Hikmat Ullah Qureshi[2], Muhammad Bilawal Khan[3], Ali Gohar Khan[4], Sarwat Noreen[5]

ABSTRACT

BACKGROUND: Breast cancer is the most common malignancy in women and leads to substantial health issues globally. Historically, Modified Radical Mastectomy (MRM) total removal of breast and tissue was a standard treatment of choice. However, advances in surgical techniques as well as oncological care has led way for Breast Conservation Surgery (BCS), where the tumor is removed, while preserving the breast's appearance. While the intent of both approaches is to provide an adequate oncological control, the perioperative outcomes, complication rates and the resulting patient quality of life have been a matter of ongoing debate when discussing comparative efficacy and aesthetic outcome. **Objective:** To compare the outcome of two different surgical methods, Modified Radical Mastectomy (MRM) and Breast Conservation Surgery (BCS), in treatment of breast cancer. **MATERIALS And Methods:** This comparative observational study was carried out at General Surgery Department Hayatabad Medical Complex Peshawar during the period (August 2020 to October 2021). A total of 120 female patients suffering from breast cancer were enrolled. A total of 57(47.5%) patients underwent MRM(Group A) whereas 63(52.5%) further received BCS for tumor excision while maintaining breast appearance (Group B). **RESULTS:** Axillary lymph node metastasis was present in 19(33.3%) cases in group A and 22(34.9%) cases in group B. In group A there were 34(59.6%) cases of TNM stage-1 and 23(40.4%) cases had stage-II, while in group B stage-I was noted in 41(65%) cases and stage-II in 22(35%) cases respectively. In group A invasive ductal carcinoma was observed in 42(73.6%) cases, invasive lobular carcinoma in 10(21.3%) and other types were 5(8.8%), while on the other hand in group B these figures were 46(73%), 12(19%) and 5(7.9%) respectively. There was no significant difference in age, menopause status and other general data, suggesting that the two groups were comparable (P>0.05). **CONCLUSION:** BCs provides better perioperative outcomes, lesser postoperative complications and aesthetic superiority than MRM in breast cancer patients.

KEYWORDS: MRM, BCS, Breast cancer, Recurrence, Complications.

1. Specialist Registrar, Surgical "C" Unit Department of General Surgery Hayatabad Medical Complex, Peshawar, Pakistan.
2. Consultant General Surgeon, King Fahad Specialist Hospital Tabuk Saudi Arabia.
3. Associate Professor Department of General Surgery Fauji Foundation Hospital, Peshawar, Pakistan.
4. Specialist Registrar, Surgical "C" Unit Department of General Surgery Hayatabad Medical Complex, Peshawar, Pakistan.
5. Associate Professor Department of Gynaecology, Fauji Foundation Hospital, Peshawar, Pakistan.

Corresponding Author: Dr. Muhammad Bilawal Khan, Specialist Registrar, Surgical "C" Unit Department of General Surgery Hayatabad Medical Complex, Peshawar, Pakistan. Email: bilawal0872000002@gmail.com

How to Cite This Article: S Muhammad[1], HU Qureshi[2], MB Khan[3], AG Khan[4], S Noreen[5].**OUTCOMES OF MODIFIED RADICAL MASTECTOMY MRM VS BREAST CONSERVATION SURGERY BCS.** JPUMHS;2024:14:03,20-25.http://doi.org/10.46536/jpumhs/2024/14.03.530

Received August 01.2024, Accepted On 15 September2024, Published On 30 September 2024.

INTRODUCTION

Breast cancer is thought to be a complicated and pervasive global public health concern, with alarming global incidence rates and ranks as the primary cause of morbidity and mortality [1,2.] During the management phase, this relentless search for better treatment led to two major surgical treatments, Modified Radical Mastectomy MRM and Breast Conservation Surgery BCS [3, 4.] There is no doubt that breast cancer is a complex biological disease with physical roots that have influenced medical and surgical paradigms for decades, but it also

evokes an emotional, psychological, and societal response from individuals and their families [5,6.] The leading cause of cancer related deaths in women worldwide is breast cancer, which contributes significantly to the global burden of disease. As breast cancer stems from a variety of subtypes, stages, and mutational landscapes, therapeutic strategies need to evolve constantly [7.] As a result, a critical decision crossroads regarding the management of breast cancer affects the choice between modified radical mastectomy MRM and breast conserving surgery BCS.

The entire breast tissue was removed during a Modified Radical Mastectomy for the treatment of breast cancer. Although successful, this approach poses issues with regards to the final postoperative aesthetics as well as the breast loss impact psychologically [10.] On the other hand, Breast Conservation Surgery which includes lumpectomy or partial mastectomy also removes the cancer but keeps the usual look of a breast. Patient satisfaction has made BCS very popular due to the combined use of efficacy and aesthetic results [11.]It is essential to understand the difference between MRM and BCS as patient-centered care becomes more prominent in medical practice. Our work is an effort to reconcile scientific understanding and the experiences of those dealing with breast cancer, providing a more complete view consistent with modern- day holistic healthcare.

MATERIAL AND METHODS

This comparative observational study was carried out at General Surgery Department Hayatabad Medical Complex Peshawar during the period (August 2020 to October 2021). A total of 120 female patients suffering from breast cancer were enrolled. Informed consent was obtained from each participant before any assessments. The inclusion criteria are a single mammary tumor confirmed by Molybdenum target mammography and pathological biopsy. Patients with distant matastasis, severe hematological or immune disorders, or other malignant tumors were excluded. MRM: It was performed in 57 (47.5%) patients categorized as group A, and is the complete removal of breast tissue which includes both breast gland, nipple-areolar complex and elective clearing of axillary lymph nodes that lies lateral to pectoralis fascia. BCS was performed in 63 patients (52.5%) and labeled as Group B. This required careful dissection to obtain clear margins and also cosmetically conserve the breast. Clear margins were taken with a technically easy to dissect margin, as we were able to easily visualize the tumor and surrounding breast. The members of the surgical team conducted visual and tactile intraoperative evaluations to verify that the malignant lesion and an appropriate margin of surrounding healthy breast tissue had been excised. Intraoperative frozen section analysis was also performed to determine margin status. This analysis determines whether the margins were positive for tumor involvement, and if so, a subsequent tissue resection was conducted until clear margins were achieved. The excised specimen margins were evaluated pathologically. A review for achieving negative margins after removal of the tumor was part of this evaluation. Pathological evaluation was performed according to standard clinical practice in order to verify that the resected tissue shows no tumor infiltration. The margin status is meticulously observed and if tumor-involved margins were identified, more tissue resection was performed and remained to have negative closing margins.

Postoperative Breast-Conserving Surgery (BCS) care included wound management, adjuvant therapies, pain management and rehabilitation. Following MRM, attention was given to wound care, drain management, pain control, and lymphedema prevention. Adjuvant therapies were administered per treatment plans. Patients were educated about lymphedema risk reduction. In both cohorts, psychosocial support was offered, considering the emotional aspects of recovery. Follow-up assessments were conducted at 10th post- operative day, 1, 3, 6 and 12 months postoperatively to monitor wound healing, pain, lymphedema, and treatment responses.

OUTCOME MEASURES

Recurrence Rate: Defined as the occurrence of breast cancer recurrence in the ipsilateral breast, this measure assessed the effectiveness of BCS and MRM in preventing local disease recurrence.

Peri-operative outcome: This measure evaluated the long-term survival rates of patients in both treatment groups, reflecting the impact of the surgical approach on patients' ultimate survival outcomes. Complication Rates: Postoperative complications, including wound infections, hematoma, seroma, and lymphedema, were monitored and quantified to assess the safety and surgical morbidity associated with BCS and MRM.Aesthetic Outcome: aesthetic outcomes were evaluated through standardized assessment

tools and patient self-assessment, providing insights into the aesthetic satisfaction and body image perception of participants.Data analysis was performed using SPSS 23.0. A significance level of $p \leq 0.05$ was considered statistically significant.

RESULTS

Age of patients ranged between 25-60 years in both groups. In group A mean age was 42.5±19.1 years and 41.1±19.9 years in group B. In group A 11(19.2%) patients experienced menopausal status, while this ratio was 10(15.9%) in group B. Mean tumour size (volume) was 0.2871 cm^3 in group A and 0.2218 cm^3 in group B. In group A, tumor was located at UOQ in 31(54.4%) cases, LOQ in 8(14%) cases, UIQ in 10(17.5%) cases and LIQ 8(14%) cases. In group B tumor location was UOQ in 32(50.8%) cases, LOQ 12(19%) cases, UIQ 15(23.8%) cases and LIQ 4(6.3%) cases respectively. Axillary lymph node metastasis was present in 19(33.3%) cases in group A and 22(34.9%) cases in group B. In group A there were 34(59.6%) cases of TNM stage-1 and 23(40.4%) cases had stage-II, while in group B stage-I was noted in 41(65%) cases and stage-II in 22(35%) cases respectively. In group A invasive ductal carcinoma was observed in 42(73.6%) cases, invasive lobular carcinoma in 10(21.3%) and other types were 5(8.8%), while on the other hand in group B these figures were 46(73%), 12(19%) and 5(7.9%) respectively. There was no significant difference in age, menopause status and other general data, suggesting that the two groups were comparable (P>0.05). Table 1.

(Table-1) In group A operation time was between 80-120 minutes (mean 100 min), while in group B this ratio was 60-80 minutes (mean 70 min). Incision length in group A was 8-13 cm (mean 10.5cm) and in group B 5-7 cm (mean 6 cm). Intraoperative blood loss in group A was 60-82 ml (mean 71 ml) while in group B 40-61 ml (mean 50.5ml), length of hospital stay in group A was 6-10 days (mean 8 days) and 4-8 (mean 6 days) in group B (Table-2).

Postoperative complications were: subcutaneous effusion 5(8.8%) cases in group A and 3(4.8%) cases in group B, subcutaneous hemorrhage in both groups were 4(7%) and 2(3.1%), skin flap necrosis was 2(3.5%) in Group A and 2(3.1%) in group B, upper limb edema in group A was present in 2(3.1%) cases and 1(1.5%) cases in group B respectively (Table-3).

Pathological examination of the excised specimen margins in group B revealed that clear margins was achieved with no evidence of tumor involvement in 47(74.6%) cases, 11(17.5%) patients had close margins, where tumor cells were present close to the margin but without direct involvement, while 5(7.9%) patients showed positive margins (Table-4).

In group B, excellent aesthetic outcome was recorded in 41(65%) cases, good aesthetic outcome in 12(19%), fair aesthetic outcome in 7(11.1%) and poor aesthetic outcome in 3(4.7%) cases respectively. On the other hand in group A poor aesthetic outcome was observed in all cases (Table-5). No recurrence was noted on 10^{th} and 30^{th} Post op day, however recurrence after 3, 6 and 12 months in group A was noted in 1(1.7%), 1(1.7%) and 3(5.3%) cases, while in group B this figure was 1(1.6%), 2(3.1%) and 4(6.3%) cases respectively. Mortality was recorded 2(3.5%) in group A and 3(4.8%) in group B (Table-6).

Table 1: Demographics & Clinical Characteristics

Characteristic	Group A	Group B	p-value
Age(mean±SD)	42.5±19.1	41.1±19.9	0.811
Menopausal status	11(19.2%)	10(15.9%)	0.699
Tumor Size (volume)	0.2871 cm^3	0.2218 cm^3	0.701
Axillary lymph node	19(33.3%)	22(34.9%)	0.690
TNM stage			
TNM stage-I	34(59.6%)	41(65%)	0.603
TNM stage-II	23(40.4%)	22(35%)	0.814
Tumor / carcinoma type			
Invasive ductal Ca	42(73.6%)	46(73%)	0.901
Invasive lobular Ca	10(21.3%)	12(19%)	0.667
Other types Ca	5(8.8%)	5(7.9%)	0.793
Tumor location			
UOQ	31(54.4%)	32(50.8%)	0.777
LOQ	8((14%)	12(19%)	0.680
UIQ	10(17.5%)	8(14%)	0.811
LIQ	8((14%)	4(6.3%)	0.501
Immunohistochemistry			
ER (+)	39	50	0.590
PR (+)	20	28	0.660
HER2 (+++)	3	4	0.901

Table-2: Perioperative outcome

Outcome	Group A	Group B	p-value
Operative time mean	100 min	70 min	0.010
Incision length mean	10.5 cm	6 cm	0.031
Blood loss mean	71 ml	50.5 ml	0.020
Hospital stay mean	8 days	6 days	0.080

Table-3: Postoperative complications

Complications	Group A	Group B	p-value
Subcutaneous effusion	5(8.8%)	3(4.8%)	0.021
Subcutaneous hemorrhage	4(7%)	2(3.1%)	0.010
Skin flap necrosis	2(3.5%)	2(3.1%)	0.100
Upper limb edema	2(3.1%)	1(1.5%)	0.401
Total	13(22.8%)	8(12.7%)	0.003

Table-4: Pathological examination of the specimen

Margins	Frequency	Percentage
Clear margins	47	74.6%
Close margins	11	17.5%
Positive margins	5	7.9%

Table-5: Aesthetic outcome

Aesthetic outcome	Group A	Group B	p-value
Excellent	0(0%)	41(65%)	<0.001
Good	0 (0%)	12(19%)	<0.001
Fair	0 (0%)	7(11.1%)	<0.001
Poor	57(100%)	3(4.7%)	<0.001

Table-6: Recurrence rate & mortality

Recurrence /mortality	Group A	Group B	p-value
3 months	1(1.7%)	1(1.6%)	0.211
6 months	1(1.7%)	2(3.1%)	0.091
12 months	3(5.3%)	4(6.3%)	0.080
Mortality	2(3.5%)	3(4.8%)	0.068

DICSUSSION

Management of breast cancer is a complex process and requires thorough evaluation of the various surgical techniques. According to our study, when compared with mastectomy, BCS further demonstrated significantly shorter operation time, smaller incisions, intraoperative blood loss and shorter hospital stay. These findings are consistent with those of other studies and highlight the potential advantages of BCS in terms of reduced surgical invasiveness and patient recovery [12,13]. However, the choice of each type of surgery are to be made in an individual manner depending on tumor characteristics, patient preferences and the feasibility of achieving clear margins [14].In a study by Wang et al, shorter operative time of Breast Conservation Surgery BCS was associated with decrease trauma which resulted in better recovery and perioperative outcomes [15]. Guo et al reported that, removal of breast during modified radical mastectomy MRM had adverse effects and resulting in postoperative subcutaneous effusion, subcutaneous hemorrhage, infection and upper limb edema [16]. In this study BCS was associated with better perioperative outcomes and a lower rate of postoperative complications due to a variety of factors. Firstly, BCS is less invasive compared with MRM in that only removing the breast tissue affected by single tumors without resecting the totally involved breasts [20]. Moreover, the use of free flaps on the affected side during MRM contributes damage to the superficial fascia and peripheral tissues including pectoralis major and minor muscles [16,17].Prognosis remains one of the most important considerations in clinical practice. This study confirms that the prognosis of patients undergoing Breast Conservation Surgery BCS is as good as those undergoing Modified Radical Mastectomy MRM. There were no significant differences in the recurrence, and mortality at 3, 6 and 12 months postoperatively between both groups. This is in agreement with the findings from a meta- analysis by Zehra et al on the outcome of BCS versus MRM which summarized there was no significant differences in overall survival [18].Over the years, there have been advances in radiotherapy, chemotherapy and endocrine treatment that have resulted in a reduction of postoperative recurrence in early breast cancer [19]. Our 12 month follow up recurrence rate of 3.3% is lower than what reported by De Lorenzi et al 15% [20]. The difference between different subgroup of people can be largely due to the continuous improvement in adjuvant treatment, surgical techniques for resection, lymph node dissection LND, and early detection methods [21].There will be a more nuanced decision-making process involved in deciding what type of surgery is most advantageous to the individual patient MRM or BCS. Although BCS offers marked advantages with respect to perioperative outcomes and preservation of aesthetics, it should be performed selectively when clear margins can be obtained without compromise of the patients' safety. Our findings add to the elucidation of proper managing patients with breast cancer, emphasizing the necessity of a complete patient counseling and shared decision-making.

CONCLUSION

This study adds across the board evidence for

improved perioperative outcomes, lower postoperative complications and better aesthetic results in breast conservative surgery BCS as opposed to modified radical mastectomy MRM. Importantly, BCS does not compromise long-term oncological outcomes, with similar recurrence and mortality rates. The choice between these surgical approaches should be individualized, considering tumor characteristics and patient preferences.

ETHICS APPROVAL: The ERC gave ethical review approval.
CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.
FUNDING: The work was not financially supported by any organization. The entire expense was taken by the authors.
ACKNOWLEDGEMENTS: We are thankful to all who were involved in our study.
AUTHORS' CONTRIBUTIONS:
All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.
CONFLICT OF INTEREST: No competing interest declared

REFERENCES

1. Globocan. 2018. Accessed: June 4, 2020: https://gco.iarc.fr/today/data/factsheets/populations/586-pakistan-fact-sheets.pdf.
2. Wang SE, Sun YD, Zhao SJ, Wei F, Yang G. Breast conserving surgery BCS with adjuvant radiation therapy showed improved prognosis compared with mastectomy for early staged triple negative breast cancer patients. Mathematical Biosciences and Engineering 2019, 171, 92-104. 10.3934/mbe.2020005.
3. Wunderle M, Gass P, Haberle L, Flesch VM, Rauh C. BRCA mutations and their influence on pathological complete response and prognosis in a clinical cohort of neoadjuvantly treated breast cancer patients. Breast Cancer Research and Treatment 2018, 1711, 85-94. 10.1007/s10549-018-4797-8.
4. Zehra S, Doyle F, Barry M, Walsh S, Kell MR. Health-related quality of life following breast reconstruction compared to total mastectomy and breast-conserving surgery among breast cancer survivors: a systematic review and meta-analysis. Breast Cancer, 2020; 274: 534. 10.1007/s12282-020-01076-1.
5. Deepa KV, Gadgil A, Lofgren J, Mehare S, Bhandarkar P, Roy N. Is quality of life after mastectomy comparable to that after breast conservation surgery? A 5-year follow up study from Mumbai, India. Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation 2020; 293: 683-692. 10.1007/s11136-019-02351-1.
6. Deng M, Chen HH, Zhu X, Luo M, Zhang K, Xu CJ, Hu KM, Cheng P, Zhou JJ, Zheng S, Chen YD. Prevalence and clinical outcomes of germline mutations in BRCA1/2 and PALB2 genes in 2769 unselected breast cancer patients in China. International Journal of Cancer 2019; 1456, 1517-1528. 10.1002/ijc.32184.
7. De Santis CE, Goding Sauer A, Newman LA, Jemal,. Breast cancer statistics 2017; racial disparity in mortality by state. CA: a Cancer Journal for Clinicians, 676, 439-448. 10.3322/caac.21412.
8. Ein Ali Afjeh, M Pourahmad R, Akbari-Adergani B, Azin M. Characteristics of glucose oxidase immobilized on magnetic chitosan nanoparticles. Food Science and Technology 2020, 401: 68-75. 10.1590/fst.32618.
9. Fan DW, Li XH, Yao CY, Zhang C, Yao T. Clinical efficacy of patients with breast cancer treated with breast-conserving therapy and modified radical mastectomy in China. International Journal of Surgery 2017, 449: 603-606.
10. Ren T, Wu J, Qian L, Liu J, Ni K. Comparison of Efficacy and Psychology of Breast-Conserving Surgery and Modified Radical Mastectomy on Patients with Early Breast Cancer under Graded Nursing. Comput Math Methods Med. 2022; 16: 4491573. 10.1155/2022/4491573.
11. Monteiro-Grillo I, Marques-Vidal P, Jorge M. Psychosocial effect of mastectomy versus conservative surgery in patients with early breast cancer. Clin Transl Oncol. 2005; 711: 499-503 10.1007/BF02717003.
12. Curran D, van Dongen JP, Aaronson NK, Kiebert G, Fentiman IS, Mignolet F, Bartelink H. Quality of life of early-stage breast cancer patients treated with radical mastectomy or breast-conserving procedures: results of EORTC Trial 10801. The European Organization for Research and Treatment of Cancer EORTC, Breast Cancer Co-operative Group BCCG. Eur J Cancer. 1998; 343:307-14. 10.1016/s0959-80499700312-2. PMID: 9640214.
13. Pusic A, Thompson TA, Kerrigan CL, Sargeant R, Slezak S, Chang BW,

Kelzlsouer KJ, Manson PN. Surgical options for the early-stage breast cancer: factors associated with patient choice and postoperative quality of life. Plast Reconstr Surg 1999; 1045:1325-33. 10.1097/00006534-199910000-00013.

14. Qiu H, Xu WH, Kong J, Ding XJ, Chen DF. Effect of breast-conserving surgery and modified radical mastectomy on operation index, symptom checklist-90 score and prognosis in patients with early breast cancer. Medicine Baltimore 2020; 9911, article e19279. 10.1097.
15. Wang HY, Li Z, Sun SF. Effect of modified radical mastectomy and breast conserving surgery on early breast cancer patients. China Foreign Medical Treatment 2019; 382: 68-70.
16. Guo Y, Zhang L, Gu L. Feasibility of neoadjuvant chemotherapy combined with breast conserving surgery for breast cancer. Tumor 2018; 38: 242-249.
17. Mohamed F, Ahmed SA, Mohamed AE. Breast-conserving therapy versus modified radical mastectomy in the early breast cancer management: oncological outcome and quality of life. The Medical Journal of Cairo University 2019; 87: 1639-1647. 10.21608/mjcu.2019.53898.
18. Zehra S, Doyle, F, Barry, M, Walsh S, Kell M. Health- related quality of life following breast reconstruction compared to total mastectomy and breast-conserving surgery among breast cancer survivors: a systematic review and meta-analysis. Breast Cancer 2020, 274, 534. http://dx.doi.org/10.1007/s12282-020-01076-1.
19. Kontodimopoulos N, Ntinoulis K, & Niakas D. Validity of the Greek EORTC QLQ-C30 and QLQ-BR23 for measuring health-related quality of life in breast cancer patients. European Journal of Cancer Care 2019, 203, 354-361. http://dx.doi.org/10.1111/j.1365-2354.2009.01170.x.
20. De Lorenzi F, Hubner G, Rotmensz N, Bagnardi V, Loschi P, Maisonneuve P, Venturino M, Orecchia R, Galimberti V, Veronesi P, Rietjens M. Oncological results of oncoplastic breast-conserving surgery: Long term follow-up of a large series ata single institution: a matched-cohort analysis. European Journal of Surgical Oncology 2018, 421, 71-77. http://dx.doi.org/10.1016/j.ejso.2015.08.160. PMid:26382101
21. Van Maaren MC, Munck L, Bock GH, Jobsen J & Siesling S. 10 year survival after breast-conserving surgery plus radiotherapy compared with mastectomy in early breast cancer in the Netherlands: a population-based study. The Lancet. Oncology 2019, 178, 1158-1170. http://dx.doi.org/10.1016/S1470-20451630067- 5