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

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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 5747.5% patients underwent MRM Group A whereas 6352.5% further received BCS for tumor excision while maintaining breast appearance Group B. **RESULTS:** Axillary lymph node metastasis was present in 1933.3% cases in group A and 2234.9% cases in group B. In group A there were 3459.6% cases of TNM stage-I and 2340.4% cases had stage-II, while in group B stage-I was noted in 4165% cases and stage-II in 2235% cases respectively. In group A invasive ductal carcinoma was observed in 4273.6% cases, invasive lobular carcinoma in 1021.3% and other types were 58.8%, while on the other hand in group B these figures were 4673%, 1219% and 57.9% 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.

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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 constantly⁷. 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 psychologically¹⁰. 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 results¹¹. 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 metastasis, 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 1119.2% patients experienced menopausal status, while this ratio was 1015.9% 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 3154.4% cases, LOQ in 814% cases, UIQ in 1017.5% cases and LIQ 814% cases. In group B tumor location was UOQ in 3250.8% cases, LOQ 1219% cases, UIQ 1523.8% cases and LIQ 46.3% cases respectively. Axillary lymph node metastasis was present in 1933.3% cases in group A and 2234.9% cases in group B. In group A there were 3459.6% cases of TNM stage-I and 2340.4% cases had stage-II, while in group B stage-I was noted in 4165% cases and stage-II in 2235% cases respectively. In group A invasive ductal carcinoma was observed in 4273.6% cases, invasive lobular carcinoma in 1021.3% and other types were 58.8%, while on the other hand in group B these figures were 4673%, 1219% and 57.9% 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 58.8% cases in group A and 34.8% cases in group B, subcutaneous hemorrhage in both groups were 47% and 23.1%, skin flap necrosis was 23.5% in Group A and 23.1% in group B, upper limb edema in group A was present in 23.1% cases and 11.5% 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 4774.6% cases, 1117.5% patients had close margins, where tumor cells were present close to the margin but without direct involvement, while 57.9% patients showed positive margins Table-4.

In group B, excellent aesthetic outcome was recorded in 4165% cases, good aesthetic outcome in 1219%, fair aesthetic outcome in 711.1% and poor aesthetic outcome in 34.7% cases respectively. On the other hand in group A poor aesthetic outcome was observed in all cases Table-5.

No recurrence was noted on 10th and 30th Post op day, however recurrence after 3, 6 and 12 months in group A was noted in 11.7%, 11.7% and 35.3% cases, while in group B this figure was 11.6%, 23.1% and 46.3% cases respectively. Mortality was recorded 23.5% in group A and 34.8% 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	1119.2%	1015.9%	0.699
Tumor Size volume	0.2871 cm ³	0.2218 cm ³	0.701
Axillary lymph node	1933.3%	2234.9%	0.690
TNM stage			
TNM stage-I	3459.6%	4165%	0.603
TNM stage-II	2340.4%	2235%	0.814
Tumor / carcinoma type			
Invasive ductal Ca	4273.6%	4673%	0.901
Invasive lobular Ca	1021.3%	1219%	0.667
Other types Ca	58.8%	57.9%	0.793
Tumor location			
UOQ	3154.4%	3250.8%	0.777
LOQ	814%	1219%	0.680

Characteristic	Group A	Group B	p-value
UIQ	1017.5%	814%	0.811
LIQ	814%	46.3%	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	58.8%	34.8%	0.021
Subcutaneous hemorrhage	47%	23.1%	0.010
Skin flap necrosis	23.5%	23.1%	0.100
Upper limb edema	23.1%	11.5%	0.401
Total	1322.8%	812.7%	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%	4165%	<0.001
Good	0 0%	1219%	<0.001
Fair	0 0%	711.1%	<0.001
Poor	57100%	34.7%	<0.001

Table-6: Recurrence rate & mortality

Recurrence/mortality	Group A	Group B	p-value
3 months	11.7%	11.6%	0.211
6 months	11.7%	23.1%	0.091

Recurrence/mortality	Group A	Group B	p-value
12 months	35.3%	46.3%	0.080
Mortality	23.5%	34.8%	0.068

DISCUSSION

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 margins¹⁴. 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 outcomes¹⁵. 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 edema¹⁶. 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 breasts²⁰. 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 survival¹⁸. 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 cancer¹⁹. 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 methods²¹. 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.

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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

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