ORIGINAL ARTICLE

Recurrence Rate Following Conservative Breast Surgery Versus Modified Radical Mastectomy in Triple Negative Patients

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Abstract

Background: ***In terms of overall cancer incidence, breast cancer ranks second, and among women, it is by far the most frequent. Not only that, it kills more women than any other disease in the world. Its incidence and fatality rates vary among countries. In terms of overall cancer mortality, 16% is attributable to breast cancer, solidifying its status as a global health crisis.***

Aim and objectives: ***To find out how CBS compares to MRM in terms of oncologic and cosmetic outcomes for women whose breast cancer doesn't have any estrogen, progesterone, or human epidermal growth factor receptor 2 (referred to as "triple-negative breast cancer").***

Patients and methods: ***A prospective retrospective study was conducted on 60-breast cancer patients attempt to the Surgery Department at Bab Al-Sharya University Hospital and Damnhour oncology center from December 2023 to October 2024. And another 200 breast cancer patients retrospectively, from 2021 to 2023.***

Results: ***The recurrence rate showed an insignificant difference between the conservative and MRM group in both retrospective and prospective studies.***

Conclusion: ***For patients with triple-negative breast cancer, oncologists recommend either BCS or MRM as a safe and effective therapy choice. BCS provides superior aesthetic outcomes. According to our short-term follow-up, the recurrence rate is not significantly different for patients who had BCS compared to those who received MRM. Clinical promotion for the treatment of early-stage breast cancer is warranted; however, due to the requirement of a delay in long-term follow-up.***

Keywords: Breast Surgery; Radical Mastectomy; Triple Negative Patients

1. Introduction

In terms of overall cancer incidence, breast cancer ranks second, and among women, it is by far the most frequent. Not only that, it kills more women than any other disease in the world. Its incidence and fatality rates vary among countries. In terms of overall cancer mortality, 16% is attributable to breast cancer, solidifying its status as a global health crisis.[1]

Both breast-conserving surgery (BCS) and modified radical mastectomy (MRM) are surgical possibilities. Several investigations conducted over several years have demonstrated that compared to MRM, BCS followed by radiation had the same disease-free survival (DFS) and overall survival (OS). All of these outcomes impact the treatment decision when deciding on a surgical procedure.[2]

Breast cancer mortality and distant metastasis are both enhanced in the event of a recurrence following conservative surgery (CS) or a modified radical mastectomy. The presence of distant metastases or systemic spread prior to starting treatment can be indicated by a recurrence.[3]

Accepted 19 January 2025.
Available online 31 March 2025

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https://doi.org/10.21608/aimj.2025.446473

Multiple variables can influence the probability of cause-specific mortality after local recurrence in individuals with early-stage invasive breast cancer. Factors include the duration of disease absence, the initial tumor and lymph node staging, the patient's age, the size and kind of the recurrent tumor, and the disease-free interval.[4]

The objective of this research is to examine the cosmetic and oncologic results of three different breast cancer treatments for women who test negative for estrogen, progesterone, and human epidermal growth factor receptor 2: conservative breast surgery (CBS) and modified radical mastectomy (MRM).

2. Patients and methods

A prospective retrospective study was conducted on 60 breast cancer patients attempt to the Surgery Department at Bab Al-Sharya University Hospital and Damnhour oncology center from December 2023 to October 2024. And another 200 breast cancer patients retrospectively, from 2021 to 2023.

Sample size

Based on a study by Kadam et al.,5 Epi Info, the following hypotheses were considered while determining the sample size for this research: Eighty percent power and ninety-five percent two-sided confidence. The estimated odds ratio is 1.115, with a 5% margin of error. At its most, the Epi-Info output could produce a sample size of 120.

Inclusion criteria:

Patients who have shown histology of early-stage (stage I-II) breast cancer, who are triple-negative (meaning they do not express estrogen, progesterone, or HER2 receptors), and who do not have any additional lesions in either breast.

Exclusion criteria:

Individuals who met the following criteria were considered for inclusion in the study: advanced breast cancer, medical inability to undergo surgery, prior breast cancer diagnosis, contraindications to chemotherapy or radiation, and patients' voluntary participation following informed consent.

Ethical considerations:

The research ethics committee at Al-Azhar University examined the study's methods and gave its stamp of approval. Research participants were briefed about the study's aims and anticipated results. In order to determine if a patient was eligible for the study, we verbally obtained their consent.

Study design:

In the first group, 30 patients had non-invasive breast reconstruction. Group II: Modified radical mastectomy was performed on 30 patients. Moreover, 200 more women were diagnosed with breast cancer through a retrospective study.

Methodology:

All patients were subjected to the following:

Information on the patient's demographics, menstrual history, pertinent family medical history, and surgical and medical records (both current and prior). Final test: Checking vitals such as temperature, pulse, respiration rate, paleness, greenish discoloration, yellowing of the skin, and enlarged lymph nodes. Detailed laboratory testing including complete blood count, red blood cell count, PT, PTT, international normalized ratio, serum creatinine, S. srea, and liver enzymes.

Imaging:

Bone scans, pelvis-abdominal ultrasounds, plain chest X-rays, bilateral sonomammograms, and further imaging (local or systemic) if needed

Diagnostic pathology:

Core biopsy or wedge biopsy.

Maximal surgical effort:

Tumors with sufficient margins for safety were excised in CBS, along with axillary lymph nodes. Whole breasts, pectoral fascia, and axillary lymph nodes were removed during MRM.

Post-operative:

Cosmetic outcome: follow up of patients during healing and after complete healing. Post operative follow up: after 6-months by U\S, sonomammography, or other radiology.

Primary Outcomes of the study:

Recurrence rate and distal metastases.

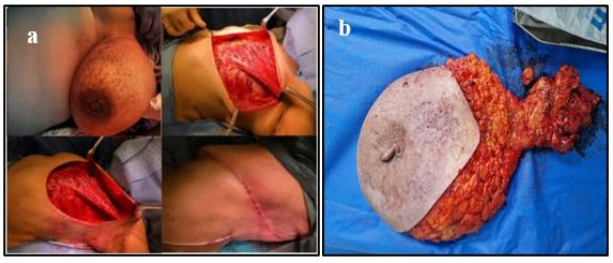

Figure1. Modified radical mastectomy steps (a) and specimen(b).

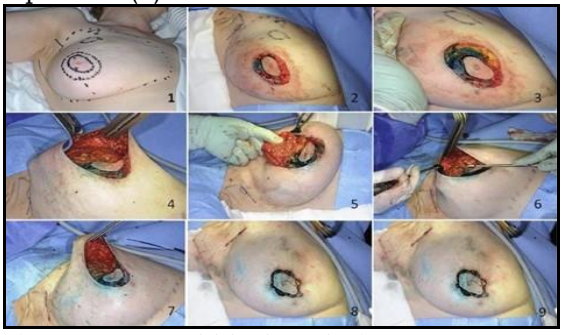

Figure 2. Round block technique

Statistical analysis

Data were submitted to the computer using IBM SPSS 24.0. The qualitative data were described by number and percent. Chi-square test

compared groups on categorical variables. For regularly distributed quantitative data, the mean and standard deviation were used. Separate t-tests compared two separate populations with properly distributed data. Two-tailed probabilities are used for significance tests. Results were considered significant at 5%. Unpaired-sample student "t" test: It compares sample group means. The Chi-Square test examines the relationship between qualitative nominal variables using frequencies. It detects if measured frequencies differ considerably from expected frequencies.

3. Results

Table 1. Comparison between the different studied groups regarding age of patients (years).

	RETROSPECTIVE "N=200"		PROSPECTIVE "N=60"	
AGE OF THE PATIENTS (YEARS)	Conservative breast surgery "n=100"	MRM "n=100"	Conservative breast surgery "n=30"	MRM "n=30"
RANGE	38-74	32-71	30-52	26-66
MEAN	52.25	50.01	40.5	44.27
SD	9.60	10.19	6.24	9.72
T TEST	1.89		1.92	
P-VALUE	0.062 N.S.		0.06 N.S.	

t-test=Student t-test; p was significant if≤0.05; N.S.=Not significant

In retrospective patients had mean value 52.25±9.60 in conservative group and 50.01±10.19 in MRM group while in prospective patients had mean value 40.5±6.24 in conservative group and 44.27±9.72 in MRM. No statistically significant differences were seen between groups in both retrospective and prospective patients (P>0.05), table 1; figure 1.

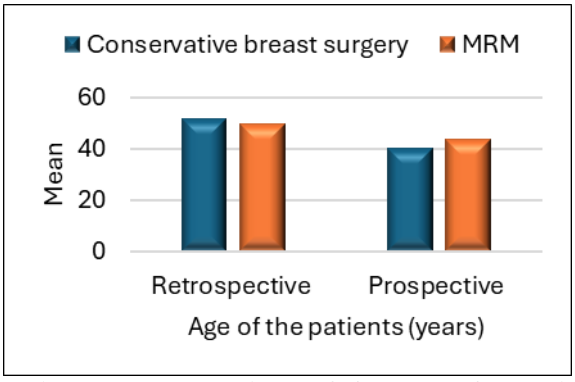

Figure 1. Comparison of the several examined groups about patient age (years).

Table 2. Comparison between the different studied groups regarding tumor size(mm).

	RETROSPECTIVE "N=200"		PROSPECTIVE "N=60"	
TUMOR SIZE(MM)	Conservative breast surgery "n=100"	MRM "n=100"	Conservative breast surgery "n=30"	MRM "n=30"
RANGE	5-46	16-47	13-40	23-49
MEAN	22.12	46.79	26.2	48.5
SD	10.76	5.66	8.18	7.36
T-TEST	5.69		6.11	
P-VALUE	0.001*		0.001*	

*Significant at level 0.05; p was significant if ≤0.05; t-test=Student t-test

Tumor size in retrospective patients had mean value 22.12±10.76 in conservative group and 46.79±5.66 in MRM group while in prospective patients had mean value 26.2±8.18 in conservative group and 48.5±7.36 in MRM group. There was statistically significant increase in MRM group than conservative group regarding tumor size in each retrospective and prospective patients(P<0.05), table 2.

Table 3. Comparison between the different studied groups regarding distance from the nipple(mm).

	RETROSPECTIVE "N=200"		PROSPECTIVE "N=60"	
DISTANCE FROM THE NIPPLE (MM)	Conservative breast surgery "n=100"	MRM "n=100"	Conservative breast surgery "n=30"	MRM "n=30"
RANGE	40-85	35-75	60-80	10-80
MEAN	60.99	52.2	68.53	43.20
SD	13.01	10.80	5.08	21.21
T-TEST	2.95		2.01	
P-VALUE	0.021*		0.038*	

t-test=Student t-test ; p was significant if≤0.05; *Significant at level 0.05

Distance from the nipple in retrospective patients had mean value 60.99±13.01 in conservative group and 52.2±10.80 in MRM group while in prospective patients had mean value 68.53±5.08 in conservative group and 43.20±21.21 in MRM. For both retrospective and prospective patients, there was a statistically significant increase in the conservative group's distance from the nipple compared to the MRM group (P<0.05), table 3; figure 2.

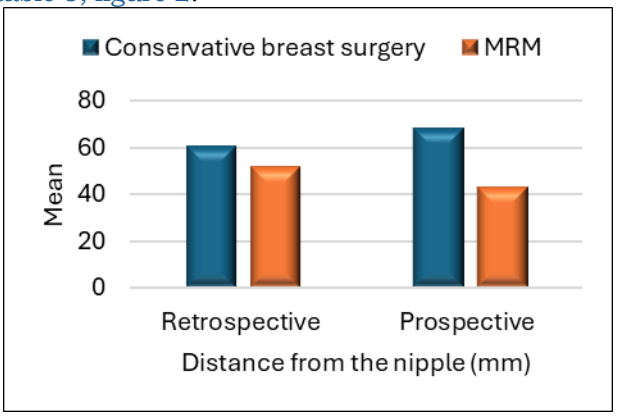

Figure 2. Comparison between the different studied groups regarding distance from the nipple (mm).

Table 4. Comparison between the different studied groups regarding operative time(min).

	RETROSPECTIVE "N=200"		PROSPECTIVE "N=60"	
OPERATIVE TIME (MIN)	Conservative breast surgery	MRM "n=100"	Conservative breast surgery	MRM "n=30"

	"n=100"		"n=30"	
RANGE	115-130	110-150	100-150	100-7.43
MEAN	122.72	127.04	123.37	130
SD	4.65	10.43	15.70	114.77
T-TEST	1.29		1.11	
P-VALUE	0.085 N.S.		0.220 N.S.	

p was significant if ≤0.05; N.S.=Not significant; t-test=Student t-tes.

Operative time in retrospective patients had mean value 122.72±4.65 in conservative group and 127.04±10.43 in MRM group while in prospective patients had mean value 123.37±15.70 in conservative group and 114.77±7.43 in MRM. For both retrospective and prospective patients, there were no statistically significant variations between the groups (P>0.05), table 4; figure 3.

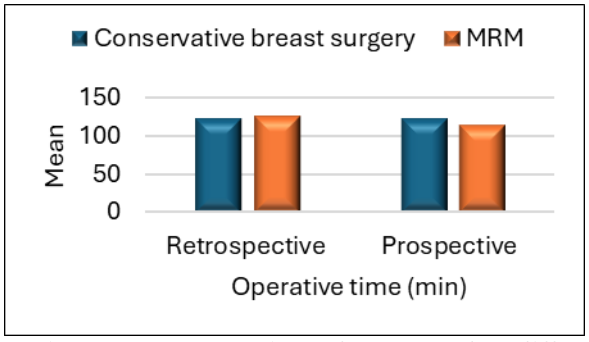

Figure 3. Comparison between the different studied groups regarding operative time(min).

Table 5. Comparison between the different studied groups regarding cosmetic results.

	RETROSPECTIVE "N=200"				PROSPECTIVE "N=60"			
COSMETIC RESULTS	Conservative breast surgery "n=100"		MRM "n=100"		Conservative breast surgery "n=30"		MRM "n=30"	
	No	%	No	%	No	%	No	%
EXCELLENT	37	37.0	0	0.0	21	70.0	0	0.0
GOOD	54	54.0	0	0.0	9	30.0	0	0.0
FAIR	9	9.0	38	38.0	0	0.0	12	40.0
POOR	0	0.0	62	62.0	0	0.0	18	60.0
X2-TEST	162.134				49.1			
P-VALUE	0.001*				0.001*			

*Significant at level 0.05; p was significant if ≤0.05; X2-test=Chi square-test

Cosmetic outcome, among retrospective patients, all patients had good(54%) and excellent(37%) cosmetic results in conservative group while poor(62%) and fair(38%) cosmetic results were in MRM group. Among prospective patients, all patients had excellent(70%) and good(30%) cosmetic results in conservative group while all patients had poor(60%) and fair(40%) cosmetic results in MRM group. Regarding cosmetic outcomes, there was a statistically significant difference (P<0.05) between the various study groups, table 5; figure 4.

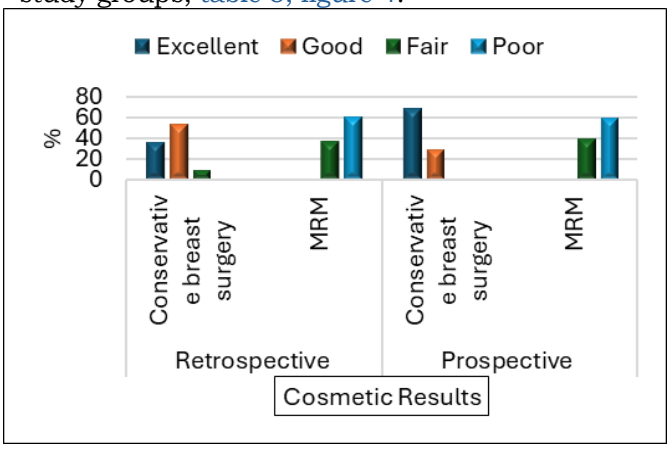

Figure 4. Comparison between the different studied groups regarding cosmetic results.

Table 6. Comparison between the different studied groups regarding post-operative Complications.

	RETROSPECTIVE "N=200"				PROSPECTIVE "N=60"			
POST-OPERATIVE COMPLICATIONS	Conservative breast surgery "n=100"		MRM "n=100"		Conservative breast surgery "n=30"		MRM "n=30"	
	No	%	No	%	No	%	No	%
NO COMPLICATION	49	49.0	40	40.0	24	80.0	14	46.7
DELAYED WOUND HEALING	11	11.0	20	20.0	0	0.0	0	0.0
HEMATOMA	4	4.0	6	6.0	0	0.0	4	13.3
SEROMA	30	30.0	8	8.0	3	10.0	9	30.0
INFECTION	0	0.0	12	12.0	3	10.0	0	0.0
WOUND DEHISCENCE	0	0.0	14	14.0	0	0.0	3	10.0
X2-TEST	1.25				16.52			
P-VALUE	0.22 N.S.				0.001*			

*Significant at level 0.05; p was significant if ≤0.05; X2-test=Chi square-test; N.S.=Not significant

Complications, no post-operative complications among retrospective patients were (49%) in conservative group and (40%) in MRM groups. There was no statistically significant difference between two studied groups regarding post-operative complications among retrospective patients (P>0.05). Regarding prospective patients, there was statistically significant increase in conservative groups (80%) than MRM group (46.7%) regarding patients without post-operative complications (P<0.05), table 6; figure 5.

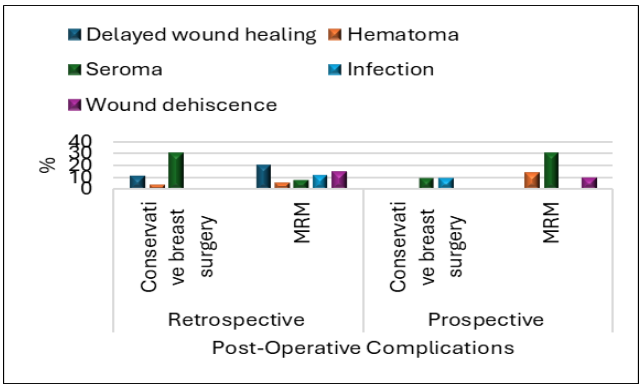

Figure 5. Comparison between the different studied groups regarding post-operative complications.

Table 7. Comparison between the different studied groups regarding recurrence.

	RETROSPECTIVE "N=200"				PROSPECTIVE "N=60"			
RECURRENCE	Conservative breast surgery "n=100"		MRM "n=100"		Conservative breast surgery "n=30"		MRM "n=30"	
	No	%	No	%	No	%	No	%
NO	90	90.0	85	85.0	28	93.3	27	90.0
YES	10	10.0	15	15.0	2	6.7	3	10.0
X2-TEST	2.13				1.02			
P-VALUE	0.192 N.S.				0.48 N.S.			

Chi square test (X2-test); p was considered significant if ≤0.05; not significant (N.S.)

There was no statistically significant difference between the different studied groups regarding recurrence(P>0.05), table 7: figure 6.

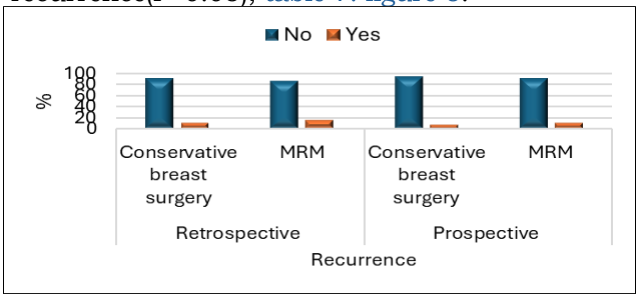

Figure 6. Comparison between the different studied groups regarding recurrence.

4. Discussion

Worldwide, breast cancer accounts for 6.6% of all cancer deaths and has an incidence of 11.6%, or 2.089 million cases. It ranks second only to lung cancer.[5]

Egypt has a lower incidence rate than the world average, but a higher fatality rate when compared to the United States and other industrialized nations .[6]

The age distribution of the patients in the conservative and MRM groups was found to be similar in both the retrospective and prospective studies. In the retrospective study, the mean age was 52.2±9.6, and in the MRM group, it was 50.01±10.1. In the prospective study, the mean age was 40.5±6.24, and in the CBS group, it was 44.27±9.72. These findings were significant in removing the impact of age on the final outcome.

Consistent with what we found, Elmas et al.,[7] the median age of the patients in the study "A Comparison Between Modified Radical Mastectomy and Breast-Conserving Surgery" was 43 (range, 27-50). The BCS group's median age ranged from 31 to 50, whereas the MRM group's ranged from 27 to 49. No discernible difference was found between the two groups under investigation.

In our study, the tumor size in MRM group in both retrospective and prospective group was significantly higher than conservative breast surgery. Also, the distance from the nipple was significantly higher in conservative breast surgery more than MRM group in the retrospective and prospective group.

In parallel with our study in the point of tumor size, Shehab et al.,[8] Researchers in the study "Evaluation of Recurrence of Breast Cancer after Conservative Breast Surgery Compared with Modified Radical Mastectomy in Triple Negative Patients" discovered that 6 patients (60%) in the CBS group had tumor sizes less than 2 cm, compared to 5 patients (50%) in the MRM group. Additionally, 4 patients (40%) in the CBS group and 4 patients (40%) in the MRM group had tumor sizes between 2 and 5 cm. There was one patient in MRM whose tumor size was greater than 5 cm. Statistical analysis revealed a noteworthy distinction (p-value: 0.047).

The study's findings revealed no statistically significant differences in tumor site between the four groups.

Whether looking at the results retrospectively or prospectively, we found no statistically significant difference in the amount of time it took for the conservative breast surgery group and the MRM group to complete their operations.

Operating times for the MRM group averaged 2.5 hours (80-190 minutes) in a trial including 82 patients, according to Wang et al. Depending on the expertise of the operating surgeon, procedure durations can be significantly reduced at specialized high-volume institutions.[9]

In contrast to our results, Guo et al.,[10] was shown to have a much longer operating time for breast removal in individuals receiving MRM compared to BCS.

Both the retrospective and prospective analyses of this study's data demonstrated that the conservative breast surgery group achieved far better cosmetic outcomes than the MRM group.

Consistent with what we found, Yang et al.,[11] Based on the aesthetic effectiveness criteria for breast reconstruction, the researchers in the study "The impact of breast-conserving surgery as well modified radical mastectomy on the postoperative

wound complications in patients with early breast cancer" determined that both patient groups experienced cosmetic effects following their operations. In the BCS group, the good rate was 93.48%(43/46), but in the MRM group, it was 50%(21/42). There were statistically significant differences ($p<0.001$) between the BCS group and the MRM group in terms of the rate of great breast appearance.

Benefiting the patient's mental health, breast-conserving surgery (BCS) allows for the preservation of the patient's breast tissue while also allowing the preservation of the breast shape.[12]

As a result, the patient experiences less physical and psychological trauma as a result of the procedure, and the cosmetic damage to their breasts is mitigated to some degree.[13]

The incidence of post operative complication in retrospective study showed insignificant difference between conservative and MRM, while in prospective study there was a significantly higher in post operative complication in MRM more than conservative surgery group.

Consistent with what we found, ELmas et al.,[14] in the research titled "A Comparison Between Modified Radical Mastectomy and Breast-Conserving Surgery," the researchers discovered that the two groups did not differ significantly in terms of the occurrence of postoperative problems.

There was no statistically significant difference in the recurrence rate between the conservative and MRM groups in our prospective and retrospective analyses.

Consistent with what we found, Qiu et al.,[15] conducted research "QALY of early breast cancer patients after breast-conserving surgery and modified radical mastectomy." One hundred patients undergoing breast-conserving surgery (BCS) and one hundred patients undergoing modified radical mastectomy (MRM) made up the study's two groups. After one and three years post-op, the researchers discovered no statistically significant differences in the rates of local recurrence, distant metastasis, and mortality.

4. Conclusion

Breast cancer patients who test negative for triple negative can choose between two oncologically safe therapy options: BCS and MRM. BCS provides superior aesthetic outcomes. According to our short-term follow-up, the recurrence rate is not significantly different for patients who had BCS compared to those who received MRM. Clinical promotion for the treatment of early-stage breast cancer is warranted; however, due to the requirement of a delay in long-term follow-up.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Authorship

All authors have a substantial contribution to the article

Funding

No Funds : Yes

Conflicts of interest

There are no conflicts of interest.

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