

Evaluation of Clinicopathological Findings and Postoperative Outcomes of Modified Radical Mastectomy in a Tertiary Care Center in Lahore, Pakistan

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ABSTRACT

Background: Modified radical mastectomy (MRM) remains the mainstay of breast cancer surgery in under-developed countries like Pakistan as it reduces the morbidity and mortality associated with radical surgery. This study aims to delineate the clinicopathological findings and postoperative outcomes of patients undergoing modified radical mastectomy for breast carcinoma in a local setting.

Material and Methods: This cross-sectional study was conducted in Gulab Devi hospital Lahore, Punjab Pakistan, from January 2016 to December 2019. Patients (n=70) with carcinoma breast planned for modified radical mastectomy were included in the study. Two suction drains were placed (in the axilla and under the flap) and removed when drainage was less than 30 cc in 24 hours. The patients were followed-up weekly for one month and then at monthly intervals for up to one year. Independent t-test and chi-square test were used to study associations between different variables. A P-value less than .05 was considered statistically significant.

Results: The mean age of the patients was 48.43 ± 12.3 years. Most of the patients (42.86%) had stage-II, grade-I carcinoma (50%) with invasive ductal carcinoma as the most frequent histological variety (80%). Majority of the patients (n=60; 85.57%) were ER/PR positive. Mean duration of surgery was 124.8 ± 20.33 minutes, the mean duration of placement of drains was 3.5±4.5 days, and the mean length of hospital stay was 4.67 ± 1.07 days. Most common complications of mastectomy were wound infection (23.57%) and seroma formation (20%). Six patients (8.57%) developed recurrence of disease in one year follow-up. Neoadjuvant chemotherapy increased the mean duration of surgery and drains placement (P<.05) but had no effect on mean hospital stay and complications associated with surgery (P>.05).

Conclusions: Grade-I invasive ductal carcinoma with ER/PR positive receptor status was the most frequent variety of breast carcinoma. Neoadjuvant chemotherapy was associated with increased operative time and increased duration of drain placement.

Key words: Breast carcinoma, Complications, Modified radical mastectomy, Neoadjuvant chemotherapy.

Authors' Contribution:

¹Conception; Literature research; manuscript design and drafting; ^{2,3} Critical analysis and manuscript review; ^{4,5} Data analysis; Manuscript Editing.

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Introduction

The mainstay for the treatment of breast carcinoma is mastectomy. Initially, radical mastectomy that removes pectoralis major muscle along with breast tissue is regarded as the standard management of breast carcinoma.¹ However, this operation is associated with high morbidity and poor cosmesis. Modified radical mastectomy (MRM) was devised to address these issues. In this technique, pectoralis major muscle is left intact while breast tissue and the associated axillary lymph nodes are removed. This technique gained popularity as it was as efficacious as radical surgery, and morbidity was markedly decreased in MRM.² With further advancement in breast surgery, breast-conserving therapy showed similar results in terms of morbidity and disfigurement. However, there are certain limitations for breast conservation therapy such as locally advanced disease and contraindications for radiotherapy, etc.³⁻⁶

MRM usually follows an uneventful recovery. Complications after MRM can be minimized with proper preoperative assessment, meticulous dissection, absolute hemostasis, and tension-free wound closure. In addition to the standard oncologic evaluation, preoperative evaluation includes an assessment of the patient's overall physiologic status, with specific consideration on the tolerability of anesthesia, uncontrolled diabetes, hypertension, anemia, or coagulopathy. Complications of modified radical mastectomy include seroma formation, wound infection and dehiscence, skin flap necrosis, hematoma formation, paresthesia of the arm along its medial aspect and lymphedema (late complication).⁷⁻⁹

MRM remains the mainstay of breast cancer surgery in under-developed countries like Pakistan. This is attributed to several reasons including the advanced stage at presentation, the lack of timely access to

high-quality investigations, unaffordable cancer treatment, limited access to radiotherapy, and the lack of training in breast conservation surgery.^{10,11} The goal of this study was to evaluate the different stages, grades, and histological types of breast cancer and complications and outcomes of mastectomy with axillary clearance performed in a four-year period, in a local setting.

Material and Methods

This cross-sectional study was conducted from January 2016 to December 2019 in Gulab Devi Hospital Lahore, Punjab Pakistan. Approval was obtained from the Institutional Review Board of Al-Aleem Medical College/ Gulab Devi Hospital Lahore, Punjab Pakistan. A sample size of 70 patients was calculated with WHO calculator at 80% confidence level, 5% margin of error, using 12% expected percentage of breast cancer.¹² Patients presenting with carcinoma breast and planned for modified radical mastectomy were included in the study through non-probability consecutive sampling method. Informed consent was taken. Patients with metastatic disease, uncontrolled diabetes mellitus, and uncompensated liver disease were excluded from the study. For diagnosis of disease, core needle biopsy of breast mass was done. Staging tests included ultrasound abdomen, CT scan of the chest and bone scan. Patients with locally advanced breast cancer (stage-III) underwent neoadjuvant chemotherapy before surgery. All patients having breast carcinoma underwent modified radical mastectomy with axillary clearance up to level II. Two suction drains were placed: one in the axilla and the other under the flap. Hemostasis was secured by diathermy and sutures. Suction drains were removed when drainage was less than 30 cc in 24 hours. The patients were advised to follow up

weekly for one month and then at monthly intervals for up to one year.

Data was statistically analyzed using SPSS v.21. Categorical variables like the stage of the disease, grade of disease, histological type, complications of the surgery, and recurrence of disease were presented as frequencies and percentages. Continuous variables including age, time of surgery, duration of the drain, and hospital stay were analyzed as mean with standard deviation. Association of neoadjuvant chemotherapy with duration of surgery, duration of the drain, and hospital stay was analyzed using independent t-test. The association of neoadjuvant chemotherapy with surgical complications was compared using chi-square test. A *P*-value of less than .05 was considered statistically significant.

Results

Out of 70 patients, 66 (94.29%) were married with a mean age of 48.43 ± 12.3 years. Most of the patients had stage-II disease (42.86%). Highly differentiated carcinoma was most prevalent (50%) and invasive ductal carcinoma was most frequent histological variety (80%) of carcinoma. Majority of patients with breast carcinoma had ER/PR positive (85.71%) receptor status (Table I). Twenty-one (30%) patients had neoadjuvant chemotherapy.

The mean duration of surgery was 124.8 ± 20.33 minutes. Suction drains were left in the axilla and under the flap for a mean duration of 3.5 ± 4.5 days ranging from 3 to 6 days. Wound infection was the most frequent complication of surgery (28.75%) followed by seroma formation (20%). Only 6 (8.57%) patients developed recurrence of disease in one-year follow-up (Table II). The mean hospital stay of all patients was 4.67 ± 1.07 days. We did not report any death during the 30-days follow-up.

| Variables | | n (%) |
|-------------------|----------------------------|------------|
| Stage | Stage-Tis | 1 (1.43) |
| | Stage-I | 18 (25.71) |
| | Stage-II | 30 (42.86) |
| | Stage-III | 21 (30) |
| Grade | Grade-I | 35 (50) |
| | Grade-II | 20 (28.57) |
| | Grade-III | 15 (21.43) |
| Histological Type | Ductal carcinoma in situ | 1 (1.43) |
| | Invasive ductal carcinoma | 56 (80) |
| | Invasive lobular carcinoma | 10 (14.28) |
| | Medullary carcinoma | 2 (2.85) |
| | Mucinous Carcinoma | 1 (1.43) |
| Receptor Status | ER | 60 (85.71) |
| | PR | 60 (85.71) |
| | HER2/neu | 20 (28.57) |

| Variables | n (%) |
|-----------------------------|------------|
| Seroma | 14 (20) |
| Wound infection | 20 (28.57) |
| Flap necrosis | 3 (4.28) |
| Respiratory Tract Infection | 2 (2.85) |
| Recurrence | 6 (8.57) |

Only 21/70 (30%) patients received neoadjuvant chemotherapy. Mean duration of surgery was significantly decreased in patients receiving neoadjuvant chemotherapy with an increase in mean duration of drain(s) placement ($P < .001$). However neoadjuvant chemotherapy had no effect on mean hospital stay (Table III). The association of neoadjuvant chemotherapy with surgical complications was statistically insignificant (Table IV).

Table III: Association of neoadjuvant chemotherapy with mean duration of surgery, duration of the drain and hospital stay

| Mean Duration | Neoadjuvant Chemotherapy | | P-value* |
|------------------------|--------------------------|--------------|----------|
| | Yes (n=21) | No (n=49) | |
| Surgery (minutes) | 100.30±12.20 | 149.32±25.46 | .001 |
| Drain placement (days) | 4.43±0.87 | 3.59±0.93 | .001 |
| Hospital stay (days) | 4.71±1.08 | 4.57±1.07 | .143 |

*P <.05 was considered as statistically significant

Table IV: Association of neoadjuvant chemotherapy with surgical complications (n=70)

| Complications | | Neoadjuvant Chemotherapy | | P-value* |
|-----------------------|-----|--------------------------|-----------|----------|
| | | Yes (n=21) | No (n=49) | |
| Seroma | Yes | 3 | 11 | .529 |
| | No | 18 | 38 | |
| Wound Infection | Yes | 7 | 13 | .564 |
| | No | 14 | 36 | |
| Flap necrosis | Yes | 2 | 1 | .432 |
| | No | 19 | 48 | |
| Respiratory infection | Yes | 1 | 1 | .732 |
| | No | 20 | 48 | |

*P <.05 was considered as statistically significant

Discussion

Modified radical mastectomy with axillary clearance is the most common surgical procedure performed for cancer of the breast. In this study, the mean age of patients was significantly lower than other studies.^{13,14} This is an alarming sign and depicts the early occurrence of breast carcinoma in the local population. We report a mean duration of 3.67 days for drain placement and 4.67 days for hospital stay, respectively. However, a study conducted by Karwasra et al.¹⁴ showed increased mean durations for drain (9.22 days) and hospital stay (9.22 days). Okada et al.¹⁵ reported mean hospital stay of 7 days. These results had higher mean duration of drain and

mean hospital stay as compared to the present study. This may be due to more meticulous dissection and heavy patient load leading to refinement of operative skills.

In this study 14(20%) patients developed seroma and 20 (20.87%) patients developed wound infection. Karwasra and colleagues¹⁴ conducted a study in Rohtak, India with a sample of seventy-five patients and documented that 11 (14.67%) patients developed wound infection, which is higher as compared to our study. Similarly, Dahri and colleagues¹⁶ conducted a study in Nawab Shah, Sindh Pakistan on 150 patients. According to their study wound infection was seen in 15 (10%) patients, seroma formation in 50 (33.3%) and wound dehiscence in 2 (1.3%) patients, respectively. Decreased rate of postoperative complications, especially seroma formation and wound infection were due to improved surgical techniques i.e., proper skin flap harvesting, absolute hemostasis, obliteration of dead space, tensionless skin closure, early physiotherapy of arm on operative side, and removal of the drain after it had remained empty for 24 hours.

Our study demonstrated that neoadjuvant chemotherapy significantly increased the mean duration of surgery and the mean duration of the drain placement. These findings are in concordance with studies conducted by Gümüş et al.¹⁷ and Uslukaya et al.¹⁸ Both these studies reported increased mean duration of surgery and mean duration of drain in patients who underwent neoadjuvant chemotherapy. They also reported increased length of hospital stay with neoadjuvant chemotherapy. In our study neoadjuvant chemotherapy had no effect on mean hospital stay and complications associated with surgery. This may be because patients were discharged and sent home with the drain. Patients were advised to come to the outpatient department, once there was minimal addition in the drain. Finally, this study depicted that

neoadjuvant chemotherapy was not associated with an increased risk of postoperative complications. Similar results were also shown by studies conducted by Adamson et al.¹⁹ and Decker et al.²⁰ irrespective of the chemotherapeutic drugs used for treatment.

Conclusion

Grade-I invasive ductal carcinoma with ER/PR positive receptor status was the most frequent variety of breast carcinoma. Neoadjuvant chemotherapy was associated with increased operative time and increased duration of drain placement.

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