International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Original Article

A Study on Local Complications of Modified Radical Mastectomy

Dr. Dhruvil B. Sutariya[1], Dr. Shaunak N. Chacha[2], Dr. Ankur G. Chaudhary[3]

[1,2,3] *Department of General Surgery, GCS Medical College, Hospital and Research Centre, Ahmedabad, 380025, India;*

Corresponding Author:

Dr. Dhruvil B. Sutariya
Department of General Surgery, GCS Medical College, Hospital and Research Centre, Ahmedabad, 380025, India;

Received: 01-01-2026
Accepted: 03-01-2026
Available online: 08-02-2026

ABSTRACT

Modified radical mastectomy (MRM) remains a cornerstone in the surgical management of breast carcinoma, particularly in settings where advanced disease presentation and limited access to breast conservation strategies are prevalent. Despite refinements in surgical technique, local postoperative complications continue to contribute significantly to patient morbidity and delays in adjuvant therapy. This observational, prospective study was conducted to evaluate the incidence, spectrum, and determinants of local complications following MRM in patients with carcinoma breast. Patients undergoing MRM were followed systematically to document complications such as seroma, hematoma, wound infection, wound dehiscence, flap necrosis, lymphedema, and local recurrence. Clinical, pathological, and treatment-related variables were analyzed to identify potential associations with postoperative morbidity. Seroma emerged as the most frequent complication, followed by wound-related issues, with higher complication rates observed in patients who received neoadjuvant chemotherapy. The findings underscore the ongoing clinical burden of local complications after MRM and highlight the importance of meticulous surgical technique, optimal perioperative care, and early identification of risk factors. Addressing these factors may reduce postoperative morbidity, facilitate timely adjuvant therapy, and ultimately improve oncological outcomes and quality of life in breast cancer patients.

Keywords*: Breast cancer; Modified radical mastectomy; Postoperative complications; Seroma; Surgical outcomes.*

INTRODUCTION

Breast cancer is the most common malignancy affecting women worldwide and represents a major public health challenge, particularly in low- and middle-income countries where patients frequently present with locally advanced disease. Surgical management remains a pivotal component of breast cancer treatment, with the primary objective of achieving complete oncological clearance while minimizing morbidity. Although breast-conserving surgery has gained prominence in early-stage disease, modified radical mastectomy (MRM) continues to be widely performed due to tumor-related factors, patient preference, and resource limitations.

MRM involves removal of the entire breast tissue along with axillary lymph node dissection and has largely replaced the classical Halsted radical mastectomy because of its comparable oncological efficacy and reduced morbidity. Nevertheless, MRM is associated with a spectrum of local postoperative complications that can adversely affect recovery, prolong hospital stay, delay adjuvant chemotherapy or radiotherapy, and impair overall quality of life. Commonly reported complications include seroma formation, hematoma, wound infection, wound dehiscence, flap necrosis, lymphedema, and locoregional recurrence.

Among these, seroma formation is consistently reported as the most frequent complication, with a multifactorial etiology involving surgical trauma, disruption of lymphatic channels, inflammatory exudation, and patient-related factors such as age, comorbidities, and prior neoadjuvant therapy. Wound-related complications and lymphedema further contribute to postoperative morbidity and may have lasting physical and psychological consequences.

Understanding the incidence and determinants of these complications is essential for refining surgical strategies, optimizing perioperative management, and improving patient outcomes. The present study was therefore undertaken to prospectively evaluate the pattern of local complications following modified radical mastectomy and to analyze associated clinical and treatment-related factors in a tertiary care setting.

MATERIALS AND METHODS

Study Design and Setting

This study was designed as an observational, prospective clinical study conducted in the Department of General Surgery at G.C.S. Medical College, Hospital and Research Centre, Ahmedabad, a tertiary care referral center. The study was carried out over a defined study period during which patients diagnosed with carcinoma breast and planned for modified radical mastectomy were consecutively enrolled.

Study Population

All patients with histologically proven carcinoma breast who underwent modified radical mastectomy during the study period were included. Both early and locally advanced breast cancer cases deemed suitable for MRM were considered. Patients undergoing breast-conserving surgery, simple mastectomy without axillary dissection, or palliative procedures were excluded. Patients with distant metastatic disease at presentation and those unfit for surgery were also excluded from the study.

Preoperative Evaluation

All patients underwent a comprehensive preoperative assessment including detailed history taking, clinical examination of the breast and regional lymph nodes, and routine laboratory investigations. Radiological evaluation comprised ultrasonography and/or mammography of the breast, with additional imaging such as magnetic resonance imaging or positron emission tomography performed when clinically indicated. Tissue diagnosis was established by fine-needle aspiration cytology or core needle biopsy. Hormone receptor status and HER2/neu expression were assessed using immunohistochemistry where feasible.

Patients receiving neoadjuvant chemotherapy were evaluated for treatment response prior to surgery using standard clinical and radiological criteria. Optimization of comorbid conditions, particularly diabetes mellitus and hypertension, was undertaken prior to surgical intervention.

Surgical Technique

All patients underwent modified radical mastectomy performed using a standardized technique. The procedure involved removal of the entire breast tissue including the nipple–areola complex along with axillary lymph node dissection. Care was taken to preserve the pectoralis major muscle. Skin flaps of uniform thickness were raised to minimize devascularization, and meticulous hemostasis was achieved throughout the procedure. Closed suction drains were placed in the axillary region and beneath the skin flaps before wound closure, which was performed in layers using absorbable sutures.

Postoperative Care and Follow-up

Postoperatively, patients were monitored for early and late local complications including seroma, hematoma, wound infection, wound dehiscence, flap necrosis, lymphedema, and local recurrence. Drains were removed once the output decreased to acceptable levels. Patients were followed up regularly in the outpatient department, and any complication was documented systematically using predefined criteria.

Outcome Measures

The primary outcome measure was the incidence of local postoperative complications following modified radical mastectomy. Secondary outcomes included identification of patient-related and treatment-related factors associated with these complications, particularly the impact of neoadjuvant chemotherapy.

Statistical Analysis

Data were recorded in a structured proforma and analyzed using appropriate statistical methods. Categorical variables were expressed as frequencies and percentages. Associations between clinical variables and postoperative complications were assessed using suitable statistical tests, with a p-value of less than 0.05 considered statistically significant.

RESULTS AND DISCUSSION

Patient Characteristics

A total of 100 patients with biopsy-proven carcinoma breast who underwent modified radical mastectomy were included in the study. The mean age of the study population was 53.9 ± 12.18 years, with the majority of patients belonging to the 41–60 year age group. Most patients presented with a breast lump (100%), while pain (14%), nipple discharge (5%), and

ulceration (2%) were less frequent presenting complaints. The left breast was affected in 57% of cases, while 43% involved the right breast.

Tumors were most commonly located in the upper outer quadrant (76%), followed by the upper inner quadrant (18%), central region (19%), lower outer quadrant (8%), and lower inner quadrant (3%). Tumor size ranged from less than 2 cm to more than 5 cm, with the majority of patients (76%) having tumors between 2–5 cm in diameter. Palpable axillary lymph nodes were noted in 20% of cases. With regard to menopausal status, 72% of patients were postmenopausal and 28% were premenopausal.

Comorbidities were present in 44% of patients, the most common being hypertension (39%) and diabetes mellitus (12%). Neoadjuvant chemotherapy was administered in 12% of patients, of whom a substantial proportion subsequently developed postoperative complications. Histopathological examination revealed invasive ductal carcinoma as the predominant subtype (94%), followed by invasive lobular carcinoma, mucinous carcinoma, metaplastic carcinoma, and solid papillary carcinoma.

Incidence of Local Postoperative Complications

Local postoperative complications were observed in 28% of patients following modified radical mastectomy. Seroma formation was the most frequent complication, occurring in 17% of cases. Other complications included wound dehiscence in 7%, wound infection in 5%, flap necrosis in 2%, hematoma in 2%, lymphedema in 1%, and local recurrence in 1% of patients. Seventy-two percent of patients had an uncomplicated postoperative course.

The majority of patients who developed complications belonged to the older age groups and had associated comorbid conditions. Among the 44 patients with comorbidities, 11 developed postoperative complications, highlighting the influence of systemic health status on surgical outcomes. Patients who received neoadjuvant chemotherapy demonstrated a notably higher complication rate, with 9 out of 12 such patients developing one or more local complications.

DISCUSSION

The present prospective observational study demonstrates that postoperative morbidity following modified radical mastectomy remains clinically significant, with an overall complication rate of 28%. This finding is comparable with rates reported in the literature, where complication rates following mastectomy with axillary dissection have been reported to range between 20% and 40%. Seroma formation was identified as the most common postoperative complication, affecting 17% of patients, consistent with previous studies that describe seroma as the predominant source of morbidity after breast surgery.

The pathogenesis of seroma formation is multifactorial and includes extensive disruption of lymphatic channels during axillary dissection, inflammatory exudation, and the creation of dead space beneath skin flaps. In the present study, seroma was associated with prolonged drain duration and the need for repeated aspirations in some patients, contributing to patient discomfort and delayed recovery.

Wound-related complications, including wound dehiscence (7%) and surgical site infection (5%), constituted the next most frequent group of complications. These complications were more commonly observed in patients with comorbidities such as diabetes mellitus and hypertension, as well as in those who had received neoadjuvant chemotherapy. Chemotherapy-induced immunosuppression, impaired microvascular circulation, and delayed tissue healing are likely contributors to the increased susceptibility to wound complications in this subgroup.

Flap necrosis and hematoma were relatively infrequent, each occurring in 2% of patients, but remain clinically important due to their potential to progress to secondary wound infection or delayed healing if not promptly managed. Careful flap elevation with preservation of subdermal plexus, meticulous hemostasis, and appropriate drain placement are essential preventive measures.

Lymphedema was observed in 1% of patients as a late complication following axillary lymph node dissection. Although the incidence was low, lymphedema can significantly impair upper limb function and quality of life, underscoring the importance of patient education, early physiotherapy, and long-term follow-up.

The higher incidence of complications among patients receiving neoadjuvant chemotherapy in this study is in agreement with existing evidence, emphasizing the need for heightened perioperative vigilance and individualized risk stratification in this patient population. Overall, the findings highlight the continued relevance of identifying modifiable risk factors and implementing standardized perioperative protocols to reduce postoperative morbidity following modified radical mastectomy.

CONCLUSIONS

This prospective observational study demonstrates that local postoperative complications following modified radical mastectomy remain a significant source of morbidity, with seroma formation being the most frequent complication. Patients receiving neoadjuvant chemotherapy were found to have a higher incidence of wound-related complications. Early identification of high-risk patients, meticulous surgical technique, and standardized postoperative care protocols are essential to reduce complication rates and prevent delays in adjuvant therapy. The findings underscore the need for continued refinement of surgical practices and perioperative management strategies to improve outcomes in breast cancer surgery.

Ethics approval and consent to participate

The study was conducted after obtaining approval from the Institutional Ethics Committee of G.C.S. Medical College, Hospital and Research Centre, Ahmedabad. Written informed consent was obtained from all participants prior to inclusion in the study.

List of abbreviations

MRM: Modified Radical Mastectomy
NAC: Neoadjuvant Chemotherapy
HER2: Human Epidermal Growth Factor Receptor 2
Data Availability
The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The author(s) declare(s) that there is no conflict of interest regarding the publication of this paper.

Funding Statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions

SB contributed to study conception and design, data collection, and manuscript drafting. All authors read and approved the final manuscript.

Acknowledgments

The authors acknowledge the support of the Department of General Surgery and the medical and nursing staff of G.C.S. Medical College, Hospital and Research Centre, Ahmedabad, for their assistance during patient management and data collection.
Supplementary Materials
Not applicable.

REFERENCES

1. Bose, S.M., Kaushik, R. (2022). Breast Cancer Scenario in India. In: Sharma, S.C., Mazumdar, A., Kaushik, R. (eds) Breast Cancer. Springer, Singapore. https://doi.org/10.1007/978-981-16-4546-4_1
2. Williams NS, Bulstrode CJK, O'Connell PR, editors. Bailey & Love's Short Practice of Surgery. 28th ed. London: CRC Press; 2018. Chapter 58
3. Bhandari, Akshita; Rao, Pankaj P; Tyagi, Arvind1; Routh, Dronacharya; Rehsi, Simarjit S. Clinical outcomes after modified radical mastectomy in a tertiary care hospital: An observational study. Journal of Dr. NTR University of Health Sciences 11(1):p 11-16, Jan–Mar 2022. | DOI: 10.4103/jdrntruhs.jdrntruhs_46_21
4. Fischer JP, editor. Fischer's Mastery of Surgery. 7th ed. Philadelphia: Wolters Kluwer; 2020. Chapter 54
5. Sachs M, Moulton J, editors. Schwartz's Principles of Surgery. 11th ed. New York: McGraw-Hill Education; 2019. Chapter 17
6. Sabiston DC, Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors. Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice. 21st ed. Philadelphia: Elsevier; 2022. Chapter 35