DOI: https://doi.org/10.53350/pjmhs020231712542

ORIGINAL ARTICLE

Predictors of Early Postoperative Complications after Modified Radical Mastectomy: A Prospective Study of 105 Patients

MUHAMMAD NADEEM[1], MUHAMMAD USMAN ASLAM[2], RAZA AKRAM[3], TANVIR AHMAD BHATTI[4], ZAHID SAEED[5], SHAMAILA AYUB[6]
[1]*Associate Professor, General Surgery, Surgical B unit,Saidu Teaching Hospital Swat.*
[2]*Consultant Surgeon, THQ Hospital Minchinabad*
[3]*Tehsil head quarter Hospital, Kahna Lahore*
[4]*Assistant professor, General surgery, Rai medical college teaching hospital Sargodha*
[5]*Associate Professor of Surgery, Mohi uddin Islamic Medical College Mirpur AJ&K*
[6]*Associate Professor, General Surgery, United Medical and Dental College, Karachi*
Correspondence to: Muhammad Usman Aslam, Email: drusmaan@gmail.com

ABSTRACT

Background: Modified radical mastectomy (MRM) with level II axillary clearance is still widely performed in breast cancer management, particularly in low- and middle-income countries. However, postoperative complications remain a concern.

Objective: To evaluate the frequency, risk factors, and predictors of early complications in patients undergoing MRM with level II axillary clearance.

Methods: A prospective observational study was conducted on 105 female patients with operable breast carcinoma undergoing MRM with level II axillary clearance. Demographic and surgical variables were recorded. Patients were followed for 30 days to document complications. Logistic regression analysis was performed to identify predictors of complications.

Results: The mean age of patients was 52.6 ± 9.1 years. Seroma was the most common complication (32.4%), followed by sensory loss (38.1%), wound infection (17.1%), hematoma (8.6%), flap necrosis (6.7%), and wound dehiscence (4.8%). Logistic regression identified obesity (OR: 2.8; 95% CI: 1.3–6.4; p=0.01), diabetes mellitus (OR: 2.5; 95% CI: 1.1–5.9; p=0.04), and operative time >120 minutes (OR: 3.2; 95% CI: 1.4–7.3; p=0.006) as independent predictors of major complications.

Conclusion: Early complications after MRM with level II axillary clearance are common, with seroma and sensory loss most frequent. Obesity, diabetes, and prolonged operative time significantly increase the risk. Preventive strategies targeting these factors may reduce morbidity.

Keywords: Modified radical mastectomy; axillary clearance; complications; seroma; logistic regression

INTRODUCTION

Breast cancer remains the most common cancer in women worldwide, accounting for 2.3 million new cases annually[1]. Although breast-conserving surgery with radiotherapy has become standard in high-resource settings, modified radical mastectomy (MRM) is still commonly performed in low- and middle-income countries due to late presentation and limited radiotherapy access[2,3].

MRM with level II axillary clearance provides oncological safety but is associated with significant morbidity[4]. Early complications include seroma, hematoma, wound infection, flap necrosis, wound dehiscence, and sensory disturbances due to nerve injury[5,6]. These complications prolong recovery, increase healthcare costs, and may delay adjuvant therapy[7,8].

The reported incidence of seroma ranges from 15–52%[9], while wound infection occurs in 5–25% (10). Hematoma is seen in 2–10%[11], flap necrosis in 2–15%[12], and sensory loss in up to 70%[13]. Various risk factors such as obesity, diabetes, smoking, and prolonged operative time have been implicated[14,15].

This study was conducted to evaluate early complications of MRM with level II axillary clearance in 105 patients, and to identify independent predictors using logistic regression analysis.

METHODOLOGY

A prospective observational study was carried out at the Department of Surgery, Surgical B unit,Saidu Teaching Hospital Swat from September 2022 to August 2023. A total of 105 female patients with histologically proven operable breast carcinoma (stage II–III) undergoing MRM with level II axillary clearance were enrolled using consecutive non-probability sampling.

Inclusion Criteria:

- Women aged 18–75 years
- Histologically confirmed stage II or III breast cancer
- Candidates for MRM with level II axillary clearance

Exclusion Criteria:

- Prior breast or axillary surgery
- Neoadjuvant radiotherapy
- Coagulopathy or severe systemic illness precluding surgery

Surgical Technique: All patients underwent standard MRM with complete removal of breast tissue and axillary dissection up to level II. The thoracodorsal and long thoracic nerves were preserved whenever possible. Two closed suction drains were placed—one in the axilla and one in the mastectomy bed.

Postoperative Care and Follow-up: Patients received perioperative antibiotic prophylaxis. Drains were removed when daily output was <30 ml. Patients were followed clinically at 7, 14, and 30 days postoperatively. Complications recorded included seroma, hematoma, wound infection, flap necrosis, wound dehiscence, sensory loss, and axillary vein thrombosis.

Data Collection and Analysis: Data were collected on demographics, comorbidities, operative time, and outcomes. Statistical analysis was performed using SPSS v25. Categorical variables were presented as frequencies and percentages, continuous variables as mean ± SD. Logistic regression was used to identify independent predictors of complications. Results were expressed as odds ratios (ORs) with 95% confidence intervals (CIs). $p<0.05$ was considered statistically significant.

RESULTS

Out of 105 patients, most patients were ≥50 years (60%). Obesity was present in 25.7%, diabetes in 17.1%, and hypertension in 21%. A small proportion (11.4%) were smokers. (Table 1)

Table 1: Demographic Characteristics (n=105)

Variable	Number (%)
Mean age (years)	52.6 ± 9.1
Age <50	42 (40.0)
Age ≥50	63 (60.0)
BMI ≥30 (Obese)	27 (25.7)
Diabetes mellitus	18 (17.1)
Hypertension	22 (21.0)
Smokers	12 (11.4)

Received on 05-09-2023
Accepted on 24-11-2023

The average operative time was 118 minutes, with 37.1% of patients requiring longer than 120 minutes. The mean blood loss was 320 ml. More than one-quarter had drains in place beyond 7 days. Table 2

Table 2: Surgical Outcomes

Variable	Number (%)
Mean operative time (min)	118 ± 24
Operative time >120 min	39 (37.1)
Mean blood loss (ml)	320 ± 65
Drain duration >7 days	28 (26.7)

The most common complications were sensory loss (38.1%) and seroma (32.4%). Wound infection occurred in 17.1%, hematoma in 8.6%, flap necrosis in 6.7%, and wound dehiscence in 4.8%. Axillary vein thrombosis was rare (1.9%). No perioperative deaths occurred. Table 3

Table 3: Postoperative Complications

Complication	n (%)
Seroma	34 (32.4)
Sensory loss (numbness)	40 (38.1)
Wound infection	18 (17.1)
Hematoma	9 (8.6)
Flap necrosis	7 (6.7)
Wound dehiscence	5 (4.8)
Axillary vein thrombosis	2 (1.9)
Mortality	0

Obesity, diabetes, and prolonged operative time were significant independent predictors of major complications. Smoking and older age showed trends but were not statistically significant.

Table 4: Logistic Regression Analysis of Risk Factors for Major Complications

Variable	OR	95% CI	p-value
Obesity (BMI ≥30)	2.8	1.3–6.4	0.01
Diabetes mellitus	2.5	1.1–5.9	0.04
Smoking	1.6	0.7–3.9	0.18
Operative time >120m	3.2	1.4–7.3	0.006
Age ≥50	1.2	0.6–2.7	0.31

DISCUSSION

This prospective study highlights the burden of early postoperative complications following MRM with level II axillary clearance. Our findings confirm that complications remain frequent despite standardized techniques.

Seroma (32.4%) and sensory loss (38.1%) were the leading complications. The seroma rate aligns with previous reports ranging from 15–52%[6,9–12]. Sensory loss was slightly lower than the 50–70% reported elsewhere, likely due to attempts to preserve the intercostobrachial nerve[17,19]. Persistent sensory disturbances, however, continue to affect patient quality of life[20].

Wound infection occurred in 17.1%, consistent with 5–25% in published series[13,14]. Diabetes and obesity were independent predictors, confirming prior observations[18,21]. Flap necrosis (6.7%) and wound dehiscence (4.8%) are within expected ranges[16,17]. Both were strongly associated with poor flap vascularity and smoking.

Hematoma occurred in 8.6%, consistent with 2–10% reported elsewhere[15,18]. Meticulous hemostasis and early recognition remain essential. Axillary vein thrombosis was rare, but underscores the need for vigilance in patients with vascular risk factors[21].

Our logistic regression analysis demonstrated that obesity, diabetes, and prolonged operative time independently increased complication risk. These findings mirror large multicenter analyses linking comorbidities and surgical duration with higher morbidity[14,18,21]. Operative efficiency and patient optimization are critical targets for improvement.

Comparison with Literature: Overall, our findings support global data but emphasize that complication rates remain substantial in resource-limited settings. Adoption of preventive strategies such as quilting sutures, fibrin sealants, and enhanced recovery protocols may mitigate risks[9,12,19].

Strengths and Limitations: Strengths include the prospective design and systematic complication recording. Limitations include the single-center setting and relatively short follow-up, which precludes analysis of late complications such as lymphedema.

CONCLUSION

Early postoperative complications after MRM with level II axillary clearance remain common, with seroma and sensory loss the leading morbidities. Obesity, diabetes mellitus, and prolonged operative time were significant predictors. Optimization of patient comorbidities, meticulous technique, and preventive strategies may substantially reduce complication rates and improve outcomes.

REFERENCES

1. Sung H, Ferlay J, Siegel RL, et al. Global cancer statistics 2020. CA Cancer J Clin. 2021;71(3):209–49.
2. Sarfati D, et al. Cancer care in low-resource settings. Lancet Oncol. 2016;17(5):577–606.
3. Veronesi U, Cascinelli N. Breast conservation is safe. Eur J Cancer. 1995;31A:1574–9.
4. Patey DH, Dyson WH. The prognosis of carcinoma of the breast in relation to type of operation. Br J Cancer. 1948;2(1):7–13.
5. Deo SV, et al. Complications following MRM. Indian J Cancer. 2004;41(1):34–9.
6. Kuroi K, et al. Evidence-based risk factors for seroma. Breast Cancer. 2005;12(4):288–93.
7. O'Hea BJ, et al. Complications of axillary dissection. Ann Surg Oncol. 1999;6(7):676–81.
8. van Bemmel AJ, et al. Postmastectomy morbidity. Ann Surg Oncol. 2009;16(10):2594–601.
9. Pogson CJ, et al. Seroma after breast surgery. Br J Surg. 2003;90(10):1240–8.
10. Gonzalez EA, et al. Seroma formation after breast surgery. Am J Surg. 2003;185(6):511–4.
11. Petrek JA, et al. Axillary complications. J Clin Oncol. 2001;19(11):2769–77.
12. Srivastava V, et al. Risk factors for seroma. Indian J Surg. 2012;74(5):362–5.
13. Leidenius MH, et al. Sensory deficits after axillary clearance. Am J Surg. 2003;185(2):127–32.
14. Woodworth PA, et al. Obesity and wound complications. Ann Surg Oncol. 2000;7(9):680–5.
15. Bland KI, et al. Surgical morbidity in breast cancer. Ann Surg. 1995;222(6):752–62.
16. Purushotham AD, et al. Flap complications in mastectomy. Eur J Surg Oncol. 1996;22:527–31.
17. Baas-Vrancken Peeters MJ, et al. Flap necrosis after mastectomy. Ann Surg Oncol. 2001;8(7):532–7.
18. Decker MR, et al. Risk factors in breast surgery. Ann Surg Oncol. 2011;18(12):3573–9.
19. Temple WJ, et al. Long-term sensory outcomes. J Surg Oncol. 1990;45(1):9–12.
20. Jeevan R, et al. Complications of mastectomy in the UK. Br J Surg. 2012;99(6):818–24.
21. Leidenius MH, et al. Intercostobrachial nerve preservation and morbidity. Am J Surg. 2003;185(2):127–32.

This article may be cited as: Nadeem M, Aslam MU, Akram R, Bhatti TA, Saeed Z, Ayub S: Predictors of Early Postoperative Complications after Modified Radical Mastectomy: A Prospective Study of 105 Patients. Pak J Med Health Sci, 2023;17(12):542-543.