



ANALYSIS OF EARLY WOUND COMPLICATIONS AND RISK FACTORS IN MODIFIED RADICAL MASTECTOMY WITH AXILLARY CLEARANCE

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ABSTRACT

Objective: This study aims to delineate early wound complications following modified radical mastectomy with axillary clearance and identify associated risk factors. **Study Design:** A descriptive case series was conducted, involving 150 patients who underwent Auchincloss modified radical mastectomy with axillary clearance. The patients were subsequently monitored for one month postoperatively in the outpatient department. **Results:** The age of participants ranged from 30 to 80 years. Seroma formation emerged as the predominant complication, occurring in 50 patients (33.3%), followed by wound infection in 15 patients (10%), and flap necrosis in 4 patients (2.6%). Notably, 30 patients exhibited a drainage volume exceeding 1000 ml. Wound infections were more prevalent among patients with prolonged operation times (>150 minutes) and those experiencing seroma formation. **Conclusions:** The study concludes that seroma formation is the most common complication following modified radical mastectomy with axillary clearance, and it serves as a predictive factor for subsequent wound infection and flap necrosis.

KEYWORDS : Modified radical mastectomy, Complications, Breast carcinoma, Axillary clearance.

INTRODUCTION

Breast cancer stands as the most prevalent form of cancer among women, and it ranks as the second leading cause of female mortality. Contemporary approaches to breast cancer management emphasize a multi-disciplinary strategy. Surgical interventions, including simple mastectomy, modified radical mastectomy, and breast-conservative surgery, constitute viable treatment options. For many breast cancer patients, modified radical mastectomy and wide local excision with axillary dissection serve as standard procedures. Unfortunately, early complications such as seroma formation, skin flap necrosis, and wound infection are frequent in breast surgery, contributing to heightened morbidity and mortality rates. Postoperative wound infections are specifically categorized if they manifest within one month after surgery. Numerous factors have been implicated in the onset of complications, categorized into tumor-related factors (such as tumor size and lymph node status), patient-related factors (including age, weight, diabetes mellitus, hypertension, and smoking), and surgical factors (involving the use of electrocautery for flap dissection and the duration of the operation). The choice of surgery depends on the breast cancer stage at initial presentation, patient preferences, and the surgeon's judgment. This study's primary objective is to discern the early wound complications arising from modified radical mastectomy with axillary clearance.

METHODOLOGY:

This descriptive study was conducted in Department of General Surgery, ESIC Medical College and PGIMS, Rajajinagar, Bengaluru, spanning from November 2018 to October 2020. A cohort of 1500 patients, presenting at the breast clinic with a history of breast lump, participated in the study. Detailed proforma was completed for each patient, designed to document comprehensive history and examination findings, particularly focusing on suspicions of breast malignancy. To confirm the diagnosis, all patients underwent either fine needle aspiration cytology or open biopsy. Additional diagnostic measures included ultrasound abdomen, chest X-ray, bone scan, and serum alkaline phosphatase tests. The study specifically included patients in Stage II and III, who subsequently underwent *Auchincloss* modified radical mastectomy with axillary clearance up to level II and III.

Follow-up procedures involved monitoring patients for surgical site infections for up to one month. Various variables were documented, including the length of operation time, amount of drainage, timing of drain removal, the number of recovered lymph nodes, and the involvement of lymph nodes. Comorbidities such as hypertension, diabetes mellitus, and BMI were also noted.

During the surgical procedure, flap dissection was partially conducted using diathermy. Two closed suction drains were strategically placed, with one in the axilla and the other under the flap. Hemostasis was

ensured through diathermy and sutures. Suction drains were removed within 5-7 days or earlier if drainage output was less than 30cc. Patients experiencing complications, such as seroma, wound dehiscence, and flap necrosis, were retained for inpatient treatment.

All patients were promptly referred to an oncologist within 15 days postoperatively, providing the final biopsy report detailing the excised tumor and lymph nodes, along with estrogen and progesterone receptor status. Further management plans were discussed and conveyed. Patients were advised to follow up at monthly intervals for up to two years to monitor their recovery progress.

RESULTS:

The study enrolled 150 patients diagnosed with early breast cancer, spanning an age range from 30 to 80 years. The majority of patients fell within the 40 to 60-year age bracket, with a mean age of 52 years. Notably, 30 patients were unmarried or nulliparous, and a family history of breast cancer was identified in four patients. Breastfeeding history exceeding one year was reported by 90 patients. The most prevalent complications observed were seroma, wound infection, flap necrosis, and wound dehiscence (Table I). Patients with a high body mass index, increased total drainage, greater use of diathermy, and a higher number of involved lymph nodes tended to develop more seroma. Flap necrosis was notably identified in older age group patients, smokers, and those with seroma formation. Wound infections were more prevalent in cases with prolonged operation times, seroma formation, and flap necrosis (Table II).

Complications	Number of Patients (n=150)	Percentages
Seroma	50	33.3%
Wound infection	15	10%
Skin flap necrosis	04	2.6%
Wound dehiscence	02	1.3%

In our study, all patients with seroma formation experienced resolution through multiple aspirations, pressure bandages, or open drainage within one month. Patients with flap necrosis and wound infections received treatment involving antiseptic dressings, systemic and local antibiotics, and debridement. Wounds were subsequently closed through secondary suturing or skin grafting. The hospital stay for patients ranged from 3 to 7 days, but those experiencing early wound complications extended their stay to 2 to 3 weeks.

DISCUSSION:

The prevalent surgical procedure for early breast cancer in this study was the modified radical mastectomy with axillary clearance, often accompanied by chemoradiation (multi-model therapy). Notably, a majority of patients were within the 40-60 age group, and complications such as seroma, wound infection, and flap necrosis were

more common in patients over 50 years old. This aligns with existing studies that identify advanced age as a significant risk factor for seroma formation. In our study, seroma formation emerged as the most frequent complication, affecting 50 patients, particularly noted when drains were removed prematurely, and total drainage exceeded 1000 ml. Similar findings were corroborated by other studies. The utilization of closed suction drains demonstrated a decrease in the frequency of seroma formation. Diverging from some studies where drains were removed early without considering drainage volume, our observation underscores the importance of monitoring drainage output. Seroma, while uncomfortable, necessitates multiple aspirations, pressure bandages, leading to prolonged hospital stays—an economic burden on patients, consistent with a study reporting increased hospitalization exceeding two weeks and delayed adjuvant therapy.

Table II: Characteristics of the Patients with Early Wound Complications

Characteristic	No.	Seroma	Wound infection	Flap necrosis	Wound dehiscence
Age					
• <50 years	82	15	15	00	00
• >50 years	67	35	35	04	02
Body Mass Index					
• <25	53	05	02	01	00
• 25-30	82	15	05	01	01
• >30	15	30	08	02	01
Diabetes mellitus	15	05	02	02	01
Hypertension	37	10	06	02	01
Smoking	15	05	02	02	01
Duration of operation					
• <150 min	110	10	05	01	01
• >150 min	40	40	10	03	01
Amount of discharge on 1st day					
• <200 ml	95	15	04	01	00
• >200 ml	55	35	11	03	02
Amount of Total discharge					
• <500 ml	50	07	3	1	0
• 500-1000 ml	70	18	4	1	1
• >1000 ml	30	25	8	2	1
Drainage time					
• < 5 days	55	10	05	1	0
• > 5 days	95	40	10	4	2
Involved lymph nodes					
• Nil	25	20	6	0	0
• 1-3	60	12	4	1	0
• >3	65	18	5	3	2

In our study, wound infections were observed in 15 (10%) patients, wound dehiscence in 2 patients, and flap necrosis in 4 patients. There is a potential link between infected seromas and subsequent flap necrosis. While the wound infection rate in our study is higher compared to some studies, it aligns more closely with rates reported in studies conducted in India (5.4 to 11.4%). Similar to other research, our findings suggest that improving surgical techniques—such as proper skin flap harvesting, reduced diathermy use, dead space obliteration, utilization of tissue glue, limiting shoulder movements, and timely drain removal—can prevent seroma formation. Advanced age may be associated with impaired circulation and atherosclerosis, impacting seroma interactions with underlying tissue and leading to necrosis.

Comorbidities identified in our study as complications included a body mass index >30 kg/m², hypertension, diabetes mellitus, advanced age, smoking, and the amount of drainage in the drain, consistent with observations in other studies. The occurrence of seroma emerged as a major risk factor for wound infection, attributed to the absence of certain humoral factors like complement and fibronectin in seroma. Additionally, low concentrations of albumin and transferrin in seroma may contribute to an inability of the fluid to support lymphocyte blastogenesis and the wound healing process.

CONCLUSIONS:

Seroma emerges as the most prevalent and frequent complication

following radical mastectomy with axillary clearance. Numerous factors contribute to the development of seroma and other early wound complications, including wound infection, wound dehiscence, and flap necrosis in breast surgery. These complications can be mitigated or prevented through the implementation of appropriate preventive measures.

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