



Breast Surgery

DELAYED COMPLICATIONS OF MODIFIED RADICAL MASTECTOMY: A CROSS SECTIONAL TERTIARY CARE CENTER STUDY

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ABSTRACT

Breast cancer continues to be the most common cancer among Indian women, accounting for 160000 new cases and 87000 fatalities per year. The most typical treatment for breast cancer is a modified radical mastectomy (MRM). Early complications of MRM are those that develop within the first four weeks after surgery, while late complications appear after that time. Common late consequences include pain, lymphoedema, shoulder immobility, and scar hypertrophy. In this cross-sectional study, 84 cases of pathologically proved stage 2 and stage 3 carcinoma breast after 4 weeks who have undergone modified radical mastectomy were included. A structured questionnaire was made & the collected data were tabulated and analysed using statistical software. The participants' average age was 58. (14.23). 96.3 percent of the patients had invasive breast cancer. When undergoing surgery over half of the patients (48.8%) were in Stage IIA. The majority of patients (40.3%) first experienced pain 5–6 months ago. 83.3% of them experienced radiating discomfort. After shoulder overabduction, 66.1% of people reported worsening pain, while 61.1% reported pain relief by medications. Following MRM, shoulder movement was restricted in 72.6% of cases. Chest wall tension increased in 52% of people during shoulder internal rotation, and it was relieved in 61.9% of cases after shoulder immobilisation. Oedema was experienced by about 18% of the patients after MRM. Oedema grew worse during hard lifting in 80% of cases. Exercise relieved 73% of the oedema. After MRM, 86% of patients had hypertrophic scarring at the incision site. Most common delayed complication after modified radical mastectomy was pain and shoulder mobility restriction while hypertrophic scar, chest wall tightness and oedema occur in few patients after MRM in fewer patients.

KEYWORDS : Delayed complications, Modified Radical Mastectomy, Breast Cancer

INTRODUCTION

Breast cancer is the most common female cancer. Global burden of breast cancer will increase to over 2 million new cases/year by 2030⁽¹⁾. The incidence of breast cancer is rising in India (22.9%) and is now the second most commonly diagnosed cancer in women after cervical cancer⁽²⁾. The age-standardized mortality rate for breast cancer in India was found to be 11.1/100,000 where globally it was 12.5/100,000 according to International Agency for Research on Cancer report in 2008.

Surgery is central in breast cancer treatment and two main options for breast cancer surgery exist; mastectomy and breast conserving surgery. Mastectomy with axillary dissection is a much extensive surgery compared to conservation of breast with sentinel lymph node biopsy practiced in high-income countries (HICs). Breast conserving surgery together with postoperative radiation therapy shows similar results in terms of survival to mastectomy. Several prospective long-term studies on quality of life (QOL) after breast surgery carried out in HICs have shown that body image- related QOL scores are better in the patients undergoing breast conservation surgery than in those who undergo mastectomy. Mastectomy being a much extensive surgery is expected to result in poorer QOL.

Mastectomy remains the mainstay of breast cancer surgery in India as well as many other Asian and African countries, where access to radiotherapy (RT) is extremely limited and the training in breast conservation surgery has not been widely implemented. It has been well documented that choice of surgical treatment modality does not affect the survival in the long term and similar studies comparing QOL between modified radical mastectomy (MRM) and breast conserving therapy (BCT) are few from low and middle income countries (LMICs)⁽³⁾. In addition, there is a lack of information about trends in QOL over time in breast cancer patients following surgery.

While many procedures have been performed, increasingly modified radical mastectomy is becoming the most common procedure⁽⁴⁾. In this procedure, breast tissue is removed along with the axillary lymph nodes of the same side, however, as opposed to radical mastectomy, the pectoralis major and pectoralis minor are preserved.

The complications of modified radical mastectomies can be divided into two categories: early and late. Early complications are those which occur within the first four weeks of the post-op period and late complications are those that develop after these four weeks. Seroma is the most common early complication followed by hematoma, wound infection and shoulder dysfunction. Whereas pain, lymphoedema, shoulder immobility and scar hypertrophy are the common late complications.

AIMS AND OBJECTIVES

The main aim of our study is to find out the prevalence of delayed complications of modified radical mastectomy occurring after 4 weeks post surgery.

METHODOLOGY

A cross-sectional study conducted at Department of Surgery, Government Medical College, Kozhikode, Kerala over a period from January 2021-July 2022. Study included all cases in which modified radical mastectomy performed at Department of Surgery, Government Medical College, Kozhikode, Kerala during the study period. Patients who have undergone modified radical mastectomy for stage II and III breast cancer after 4 weeks of surgery were included in the study. Patients with early breast cancers excluding stage IIA undergoing MRM, with history of previous breast surgeries, on post neo-adjuvant therapy and with history of diabetes mellitus were excluded.

The sampling technique used was convenient sampling. A sample size of 84 is obtained by using the hypothesis testing method and based on following assumptions: 95% confidence intervals, prevalence of symptomatic keloid following modified radical mastectomy was 4% and 5% margin of error.

After taking informed consent, a detailed questionnaire were administered to the selected patients, according to their convenience.. The study participants who were not available due to some reasons, they were re-approached after some days. Even after two time trials, if they will not be available or not ready to give information, will be considered under non-response.

The data was collected from the patients using a semi structured questionnaire about the delayed complications of MRM like lymphoedema, anterior chest wall tightness, shoulder mobility restriction and hypertrophic scar. The socio- demographic factors was taken by direct interview.

Collected data were entered in the excel data sheet and data analysis was done with the help of IBM SPSS statistics 25.0 software.

Ethical Concerns

The study protocol submitted to Institutional Ethics Committee, Government Medical College, Kozhikode for approval. After explaining the details regarding the study, an informed consent obtained from the participants. Confidentiality of the data will be maintained

RESULTS

A total of 84 women who had undergone modified radical mastectomy

consented and participated in the study. The data obtained from participants were analysed. The patients' age varied from 36 to 82 years. The mean (SD) age of the participants was 58 ± 14.23 and median age was 58 years. Also maximum of the post MRM patients had an age of 58 years (mode). Proportions of participants in different age groups were more or less same from 35 to 75 years with the highest proportion (22.6%) in 46-55 years age group. Only 14.3% were belonging to the age group 76-85. Almost all the patients (96.3%) had invasive breast carcinoma and only three had medullary carcinoma breast. Around half of the patients (48.8%) were in stage IIA while undergoing the surgery followed by stage IIB (27.4%) (IIIA=10.7% and IIIB=13.1%).

Majority of the patients (72/84) developed pain after modified radical mastectomy. Pain was localised in 12 patients and in 60 patients it was radiating to other sites. Four fifth of them had pain in their upper limb. Over abduction and internal rotation of shoulder aggravated the pain and pain was relieved in 61.1% of patients with appropriate medication (Table 1).

Around three fourth of the patients (72.6%) developed shoulder mobility restriction after MRM.

Prevalence of chest wall tightness among the patient who underwent MRM was 25% (21/84). More than 52% of the patients with chest wall tightness responded that internal rotation of shoulder increased the pain and 47.6% responded abduction of shoulder aggravated the symptom. Majority (61.9%) experienced relieving of same by shoulder immobilisation where 38.1% responded medications could relieve the pain

Table 1 – Distribution Of Patients Based On Characteristics Of Pain (n=72)

Characteristics of pain	Frequency	Percentage
Duration (in months)		
4-5	21	29.2
5-6	29	40.3
>6	22	30.6
Character		
Localised	12	16.7
Radiating	60	83.3
Location		
Upper limb	57	79.2
Chest	14	19.4
Lower limb	1	1.4
Aggravating factors		
Over abduction of shoulder	44	66.1
Internal rotation of shoulder	28	38.9
Relieving factors		
Medications	44	61.1
Upper limb immobilisation	28	38.9

Around 18% of the patients developed oedema after MRM.

Majority developed oedema over the chest region (93.3%) and the remaining over the upper limbs. Around half of the participants developed oedema 6 months after the surgery (46.7%) (5-6 months=40%, 4-5 months=13.3%). Heavy weight aggravated the swelling in 80% and trauma worsened it in 20% of the patients. Around 73% responded exercise relieved their swelling while 26.7% responded taking rest relieved their chest or upper limb oedema.

More than half of the post modified radical mastectomy patients (54.8%) had 3 delayed complications developed. Three (5%) of them had 5 complications and eight (9.5%) patients had developed only 1 delayed complication of MRM.

The mean number of delayed complications of MRM was 2.87 with SD 0.915. Majority (47.6%) of the patients developed delayed complication/s of MRM one-two months after surgery followed by 3 to 4 months (33.3%) and the remaining over 2-3 months.

Pain was more among those aged less than 58 years (median age of patients), those with medullary carcinoma breast and those with stage IIA or IIB, but none of the associations were statistically significant (p -value > 0.05) (Table 2).

Table 2 - Association Between Pain And Independent Variables (n=84)

Characteristics		Pain		P value
		Absent n (%)	Present n (%)	
Age (in years)	< 58a	3 (8.3)	33 (91.7)	0.220
	≥58	9 (18.8)	39 (81.3)	
Histopathological type of Ca breast	Invasive	12 (14.8)	69 (85.2)	0.471*
	Medullary	0	3 (100)	
Stage of Ca breast	IIA	5 (12.2)	36 (87.7)	0.856
	IIB	3 (13.0)	20 (87.0)	
	IIIA	2 (22.2)	7 (77.8)	
	IIIB	2 (18.2)	9 (81.8)	

a – median age of participants

*Fisher Exact test

Table 3 - Association Between Shoulder Mobility Restriction And Independent Variables (n=84)

Characteristics		Shoulder mobility restriction		P value
		Absent n (%)	Present n (%)	
Age (in years)	< 58a	5 (13.9)	31 (86.1)	0.025
	≥58	18 (37.5)	30 (62.5)	
Histopathological type of Ca breast	Invasive	23 (28.4)	58 (71.6)	0.279*
	Medullary	0	3 (100)	
Stage of Ca breast	IIA	7 (17.1)	34 (82.9)	0.093
	IIB	8 (34.8)	15 (65.2)	
	IIIA	5 (55.6)	4 (44.4)	
	IIIB	3 (27.3)	8 (72.7)	

a – median age of participants

*Fisher Exact test

Shoulder mobility was also more among those patients with age less than the median age and it was statistically significant ($p=0.025$). Histopathological type and stage of the cancer didn't have statistically significant association (Table 3).

Table 4 - Association Between Type And Stage Of Carcinoma Breast And Number Of Delayed Complications Of MRM (n=84)

Characteristics		Mean ± SD ^a	Mean difference	P value
Histological type	Invasive (n=81)	2.85 ± 0.92	-0.481	0.374
	Medullary (n=3)	3.33 ± 0.56		
Stage	IIA & IIB (n=64)	2.87 ± 0.87	0.025	0.916
	IIIA & IIIB (n=20)	2.85 ± 1.10		

a – Standard deviation

The mean number of delayed complications of MRM was higher among those with medullary carcinoma breast compared to invasive carcinoma (mean difference=0.481) and among with stage II cancer compared to stage III (mean difference=0.025), but these associations are not statistically significant (Table 4).

DISCUSSION

Surgery is a mainstay of breast cancer management, whether done before or after neoadjuvant chemotherapy. In a series of study by Abdurahman et al. mean age of patients was 50.6 and in our research population mean age was 58 ± 14.23 . The age varies from 35 to 75, with the 46- to 55-year-old age group having the largest percentage (21.6%). Only 14.3% of people in the 76–85 age bracket. While having surgery, over half of the patients in our study were in stage IIA (48.8%), then stage IIB. Although effective public awareness campaigns and readily accessible screening programmes have significantly reduced the size of presenting lesions in Western nations and industrialised nations, the situation in poor nations is still dire.

In a series by Peter et al., the incidence of discomfort after axillary dissection was 45%, but the majority of the patients had VAS scores under 5⁽⁵⁾. Similar to this, Roses et al. reported that just 2.3% of their patients who reported pain used medications⁽⁶⁾. In our investigations, delayed problems occurred in 54.8% of individuals who underwent MRM. With an SD of 0.915, the mean number of MRM's delayed complications was 2.87. One to two months after surgery, then three to four months later, the majority of patients experienced delayed problems from MRM. Most of the individuals (72/84) in our research experienced soreness following MRM. Less than 58-year-olds, those with medullary breast cancer, and those in stages IIA or IIB reported increased pain. According to Liljegren, the incidence was 49.2% for patients under 65 and 28.2% for patients over 65.

The more frequent use of the arm in the younger age group may be the

cause of this difference⁽⁷⁾. Hack et al. also discovered a strong link between the pain and the young age, the number of dissected lymph nodes, and chemotherapy in a research with 222 patients⁽⁸⁾.

Abdurahman et al. discovered that pain was the most frequent complaint and pain was seen in 50.6% of study population. In our study pain started to manifest in the majority of patients (40.3%) 5–6 months following surgery. 60 of the patients felt radiating pain, and 45 percent of them experienced pain in the upper limb. Overabduction and internal rotation of the shoulder aggravated the pain, which was treated by medication in 61.1% of cases. .Abdurahman et al. stated that 57.6% patients in the study group developed shoulder mobility restriction, while in our study 31% patients less than 58 years developed shoulder mobility restriction and it was statistically significant. In the study of Abdurahman et al. chest wall tightness seen in 14% of study population and in our study 25% of patients who underwent MRM had tightness in the chest wall. More than 52% of the patients' stiffness in the chest wall grew worse with shoulder internal rotation and 47.6% grew worse with shoulder abduction. Most of them reported that immobilising their shoulders helped them feel better. The incidence of pain in a group of patients treated for lymphedema was 30% and lymphedema was found to be one of the factors associated with increased incidence⁽⁹⁾. Around 18% of the patients developed oedema after MRM.

Majority developed oedema at chest region. Among this half of the participants developed oedema 6 months back and heavy weight lifting aggravated oedema 80% and trauma worsened it in 20% of the patients. Around 73% responded exercise relieved oedema.

Kwan et al. reported that in the presence of lymphedema, stiffness of the arm and shoulder increases from 2% to 7.1% and 5.9% to 14.2% respectively⁽¹⁰⁾. The removal of lymphatic tissue with axillary dissection decreases inflammatory response in the arm. Besides, interstitial fluid, rich for proteins and lipids, is a suitable environment for bacterial growth. Infection may also contribute to the pathogenesis of lymphedema⁽⁶⁾. Hypertrophic scar at the site of incision developed in 86% of the carcinoma breast patients after undergoing MRM. The mean number of delayed complications of MRM was higher among those with medullary carcinoma breast compared to invasive carcinoma breast and among with stage II cancer compared to stage III.

CONCLUSION

Most common delayed complication after modified radical mastectomy was pain and shoulder mobility restriction while hypertrophic scar, chest wall tightness and oedema occur in few patients after MRM.

Early postoperative mobility and induction of breast exercise have shown to reduce morbidity as per literature.

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