

## Short Term Outcome of Breast Cancer Surgery in a Tertiary Hospital

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## Abstract

## Original Research Article

**Background:** Surgery remains the primary treatment of breast cancer for over a century, though the operative treatment of breast cancer has undergone substantial changes over the time. Lumpectomy as breast conserving surgery (BCS) is gaining more acceptance than mastectomy (MRM) as the efficacy of both procedures is almost equal. This study was aimed to evaluate the early postoperative outcome of breast cancer surgery. **Patient and method:** It was an observational study which was conducted among the patients of Department of Surgical Oncology of NICRH from October 2016 to August 2017. All the eligible admitted patients were included into this study. They underwent definitive surgery and categorized as lumpectomy (BCS), 16 patients and mastectomy (MRM) 50 patients. **Results:** Out of total 66 (100%) patients 16 (24.24%) underwent lumpectomy (BCS) and 50 (75.75%) underwent mastectomy (MRM). The mean age of the patients was 37.69(SD±10.31) and 44.82(SD±7.65) in lumpectomy and mastectomy respectively. Palpable axillary lymph nodes were higher in mastectomy (MRM) group (92%) than lumpectomy (BCS) group (25%) which was statistically significant ( $P < 0.001$ ). Wound infection was present in (12.5%) in lumpectomy and (24%) in mastectomy group which is also statically not significant ( $P = 0.327$ ). Seroma was present (31.25%) in lumpectomy (BCS) and (66%) in mastectomy (MRM) respectively which is statistically significant ( $P = 0.014$ ). Flap necrosis was present (0%) in lumpectomy and (22%) mastectomy (MRM) and respectively which is also statistically significant ( $P = 0.04$ ). Mean duration of hospital stay was 6.06±0.85 and 17.70±4.70 and in lumpectomy (BCS) and mastectomy (MRM) group respectively which was statistically significant ( $P < 0.05$ ). **Conclusion:** This study showed that seroma formation, flap necrosis, wound infection, haematoma is the most common early complications of breast cancer surgery. Lumpectomy (BCS) had better post-operative outcome than mastectomy (MRM). Proper patient selection and adopting lumpectomy can reduce the early postoperative morbidities of mastectomies as well as hospital stay.

**Keywords:** Breast cancer, MRM, Lumpectomy, BCS.**Copyright © 2019:** This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

## INTRODUCTION

Breast cancer is the most common cancer in women both in the developed and less developed countries [1]. According to Global Health Estimates by WHO in 2013, worldwide over 5, 08,000 women died in 2011 due to breast cancer. It is commonly perceived that breast cancer is a disease of the developed world, however available data show that almost 50% of breast cancer cases and 58% of deaths occur in less developed countries [1]. It is the most frequently diagnosed life-threatening cancer in women. In less-developed countries, it is the leading cause of cancer death in women [2]. The modern approach to the breast cancer management is multidisciplinary. The cornerstone of breast cancer management is surgical. There are many procedures of breast cancer surgery like radical

mastectomy, modified radical mastectomy (MRM), breast conserving surgery (BCS) and oncoplastic breast surgery etc. Among the procedures, modified radical (Paty) mastectomy (MRM) is the most commonly performed surgery [3] removal of whole breast, a large portion skin, centre of which overlies the the tumour but always includes the nipple along with the thin covering overlying the pectoralis muscles, and all the fat, fascia and lymph nodes of the axilla. Lumpectomy (lum-PEK-tuh-me) is the surgery to remove cancer or other abnormal tissue from breast. It means removal of tumour with a thin rim of normal tissue. Lumpectomy is also called breast-conserving surgery (BCS) or wide local excision, partial mastectomy, wedge resection, breast-sparing therapy, tylectomy, segmental excision and quadrantectomy. Lumpectomy/Breast conservation

surgery (BCS) is also an accepted treatment for early stage breast cancer which has been shown to have similar efficacy to mastectomy in terms of overall survival [4-7]. It is also established that lumpectomy as a part of BCT has fewer complications with regard to wound complications and infections; the overall 30-day postoperative complication rate was 4.04% for mastectomy (MRM) versus 1.74% for lumpectomy (BCS) [8]. Another study by The National Surgical Quality Improvement Program Patient Safety in Surgery, prospectively collected inpatient and outpatient data showed the 30-day morbidity rates for mastectomy and lumpectomy (BCS) were 5.72% and 1.87% respectively [9]. It is also stated by St.Gallen/Vienna consensus 2015 that breast-conserving surgery is the standard care even in cases of multifocal or multicentric disease, provided that clear margins can be achieved and whole-breast radiotherapy is planned [10]. Because it is a peripheral soft tissue organ, many wound complications related to breast procedures are relatively minor and frequently are managed on an outpatient basis. Wound infection, seroma formation, hematoma and skin flap necrosis are most common cited complications in breast surgery within 30 postoperative day [11, 12]. These complications prolong hospitalization, increase the hospital cost and delay the adjuvant therapy [13]. The most frequent morbid complication of breast surgery is wound infection. The incidence rates of postoperative wound infections are variable and ranged from 3% - 19% in mastectomies [14] and 2%-14% in lumpectomies [15, 16]. More commonly occur in the mastectomy (4.34%) than the lumpectomy group (1.97%), and most infections were superficial (2.12%) [9]. A retrospective analysis carried out by The American College of Surgeons NSQIP between 2009 and 2012 showed the wound infection rates in mastectomy versus lumpectomy were 0.815% and 0.28% respectively [8]. Formation of a seroma most frequently occurs after mastectomy and axillary surgery with an incidence of 3% to 85 % [16]. It occurs about 29% in mastectomy (MRM) and 18% in lumpectomy (BCS) [18]. Iram Bokhary *et al.* [19] showed that seroma was the most common complication following breast surgery [19]. It is so common that it is now believed to be a side effect of surgery rather than a complication. Associated morbidity in the form of prolonged drainage is not only troublesome to the patient but can also significantly impact treatment by delaying adjuvant therapy and increasing risk of infection [17]. A reoperation may necessary for cases of longstanding persistent seroma [20]. Epidermolysis or flap necrosis is described as having some degree of skin necrosis. It is another troublesome complication following breast surgery. Incidence of flap necrosis is 6% to 18% in mastectomy (MRM) where as 0% in lumpectomy [19] and it is significantly higher after mastectomy in smokers compared to non-smokers (36% vs 13%) [18]. Management of epidermolysis is quite difficult as it requires excision of the necrosed flap,

regular dressing and skin grafting or secondary closure that leaves an ugly scar and significantly delays hospital stay and subsequent adjuvant therapies. It also affects the overall cost of the surgery. Widespread use of electrocautery has reduced the incidence of hematoma formation in breast surgery dramatically, but this complication continues to occur in 2% to 10% of cases of mastectomy [20]. Another study showed that hematoma occurs 13% in lumpectomy (BCS) and 29% in mastectomy (MRM) group [18]. Early arm oedema is said to occur in about half of the patients after axillary dissection. The majority, develop some degree of oedema, often so slight that they were unaware of it. The higher body mass index before and after operation increases the risk of lymphedema [21]. Multiple studies showed lymphedema in 28% and 27.8% of the patients following breast surgery [22]. Considering the morbidities and psychosomatic impact of surgery on women of breast cancer, breast cancer surgery has shifted to a new paradigm of more conservative than radical. St. Gallen/Vienna 2015 Consensus Conference declared that BCS (lumpectomy) is the standard of care, also in cases of multifocal and multicentric disease, provided that clear margins can be achieved and whole-breast radiotherapy is planned [10]. In Bangladesh, one of the less developed countries, breast cancer is the most common cancer among women. Each year, 14,900 cases of breast cancer are detected of which 16.9 percent die in this country [23]. Like many other countries, surgeons of Bangladesh have been practiced mastectomy to manage breast cancer. Lumpectomy (BCS) has also been increasingly practiced in recent times in this country. However, the early postoperative consequences of mastectomy (MRM) and lumpectomy (BCS) of breast cancer patient are not documented yet in Bangladesh.

## OBJECTIVES

### General objective

- To observe the early postoperative outcomes of breast cancer surgery (MRM and BCS).

### Specific objectives

- To observe the early postoperative outcomes like wound infection, seroma formation, flap necrosis and haematoma in lumpectomy (BCS).
- To observe the early postoperative outcomes like wound infection, seroma formation, flap necrosis and haematoma in mastectomy (MRM).

## MATERIAL AND METHODS

This study was conducted to evaluate the early post-operative outcomes of breast cancer surgery. It was an Observational study. Histologically or cytologically proven patients with breast cancer admitted in the department of Surgical Oncology of National Institute of Cancer Research Hospital, Dhaka were considered as study population. The study period was from October 2016 to August 2017. Purposive sampling technique

was used. Patients were selected from the department of surgical oncology on the basis of inclusion and exclusion criteria.

## RESULTS

This was Observational study. The main aim of this study was to evaluate and compare the early postoperative morbidities following breast cancer surgery in women. In this study all 66 patients underwent surgical treatment. Among them 50 patients were done (Mastectomy) MRM and 16 patients were done lumpectomy (BCS). Study shows that the different spectrum of lymph node status presence of palpable axillary lymph nodes were higher in mastectomy group (92.0%) than lumpectomy group (25.0%) which was statistically significant ( $P < 0.001$ ). Palpable supraclavicular lymph nodes and mobility of lymph nodes showed no significant differences between the groups ( $P > 0.05$ ). Figure shows that both lumpectomy (BCS) and mastectomy (MRM) groups showed maximum tumor sized between 2.1cm to 4.9cm (68.5.0% vs 52%,  $p=0.433$ ) which was not statistically significant. Tumor size  $\geq 5$ cm and tumor of any size extension to skin or chest wall showed 4(8.0%) and 5(10.0%) respectively only in MRM group. P-value was not significant ( $P=0.433$ ). Figure shows that in

lumpectomy (BCS) group 1 (6.25%) patients received NACT whereas in mastectomy group only 15(30.0%). These statistics showed no statistical significance ( $p=0.075$ ). Study also shows that the demographic characteristics of patients of both groups who underwent lumpectomy and mastectomy. Here it was observed that mean age ( $P < 0.01$ ), Household income ( $P < 0.001$ ), Education status ( $P=0.004$ ), Lactation status ( $P=0.004$ ) and contraceptive status ( $P < 0.001$ ) shows clearly statistically significant difference between the groups. Study also shows that in mastectomy group, estrogen positivity (54.0%), progesterone negativity (62.0%) and Her2 negativity (90.0%) were higher than their counterparts. Whereas in lumpectomy group, Estrogen positivity (56.25%), Progesterone positivity (62.5%) and Her2 negativity (68.75%) showed higher statistics than their counterparts. None of the statistics showed any statistically significant differences ( $P > 0.05$ ). Study shows Seroma present 3(18.75%) and 27(54%) in lumpectomy and mastectomy respectively. Flap necrosis was present 0(00%) in lumpectomy and 8(16%) in mastectomy. Both are statistically significant. Study shows that average duration hospital stay was  $6.06 \pm 0.85$  and  $17.70 \pm 4.70$  in lumpectomy and mastectomy which was statistically significant.

### Type of Surgery (N=66)

**Table-1: Distribution of patients according to type of surgery (N=66)**

Type of Surgery	Lumpectomy(BCS) (n=16)	Mastectomy(MRM) (n=50)	Total
	16 (24.24%)	50 (75.75%)	66 (100%)

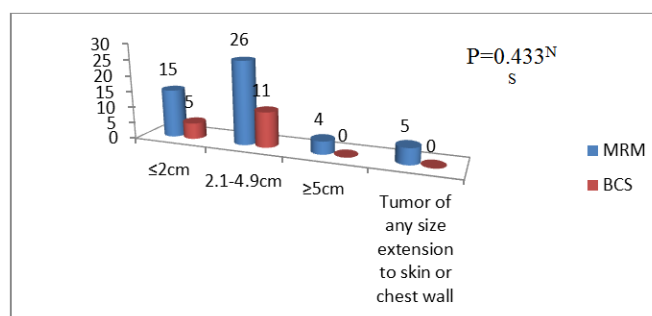
### Nodal Status (N=66)

**Table-2: Distribution of patients according to lymph node status (N=66)**

	Lymph Node Status		P-value
	Lumpectomy(BCS) (n=16)	Mastectomy(MRM) (n=50)	
Palpable axillary lymph nodes			
Present	4 (25.0%)	46 (92.0%)	$< 0.001^S$
Absent	12 (75.0%)	4 (8.0%)	
Lymph node mobility			
Fixed	0 (0%)	3 (6.0%)	0.528 <sup>NS</sup>
Mobile	16 (100%)	47 (94%)	
Presence of supraclavicular lymph nodes			
Yes	0 (0%)	5 (10.0%)	0.122 <sup>NS</sup>
No	16 (100.0%)	45 (90.0%)	

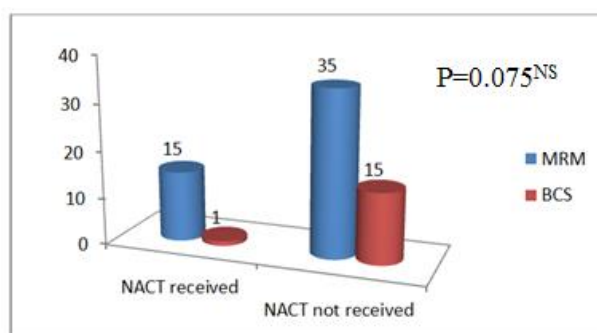
P-value was calculated by Pearson's chi square test, NS: Not significant, S: Significant, P-value was significant at  $< 0.05$ .

### Size of Tumor (N=66)



**Fig-1: Distribution of patients according to tumor size (N=66)**

**NACT Status (N=66)**



**Fig-2: Distribution of patients according to NACT status (N=66)**

**Breast Cancer (N=66)**

**Table-4: Demographic variables of patients with breast cancer (N=66)**

	Values		P-value
	Lumpectomy(BCS) (n=16)	Mastectomy(MRM) (n=50)	
Age (in years) (Mean±SD)	37.69±10.31	44.82±7.65	<0.01 <sup>S</sup>
BMI (kg/m <sup>2</sup> ) (Mean±SD)	23.65±1.29	24.13±1.67	
Household income			
Poor class (≤10,000 BDT)	0 (0%)	14 (28.0%)	<0.001 <sup>S</sup>
Middle class (10,000-25,000 BDT)	4 (25.%)	30 (60.0%)	
Affluent (>25,000 BDT)	12 (75.0%)	6 (12.0%)	
Family History			
Present	4 (25.0%)	10 (20.0%)	0.461 <sup>NS</sup>
Absent	12 (75.0%)	40 (80.0%)	
Education			
Primary	1 (6.25%)	17 (34.0%)	0.004 <sup>S</sup>
Upto SSC	3 (18.75%)	21 (42.0%)	
Upto HSC	9 (56.25%)	8 (16.0%)	
Graduate and above	3 (18.75%)	4 (8.0%)	
Marital Status			
Married	16 (100%)	45 (90.0%)	0.563 <sup>NS</sup>
Divorced	0 (0%)	2 (4.0%)	
Widow	0 (0%)	3 (6.0%)	
Lactation status			
Lactating	11 (68.75%)	46 (92%)	0.004 <sup>S</sup>
Not lactating	5 (31.25%)	4 (8.0)	
OCP			
Received	14 (87.25%)	21 (42.0%)	<0.001 <sup>S</sup>
Not received	2 (12.5%)	29 (58.0%)	

P-value was calculated by Pearson's chi square test and 't' test, NS: Not significant, S: Significant, P-value was significant at <0.05.

**Early Postoperative Complications (N=66)**

**Table-6: Distribution of patients according to the early postoperative complications (N=66)**

Early postoperative complications	Lumpectomy(BCS) (n=16)	Mastectomy(MRM) (n=50)	P-value
Wound infection			
Present	2 (12.5%)	12 (24.0%)	0.327 <sup>NS</sup>
Absent	14 (87.5%)	38 (76.0%)	
Seroma			
Present	3 (18.75%)	10 (54.0%)	0.014 <sup>S</sup>
Absent	14 (87.5%)	40 (80%)	
Flap necrosis			
Present	0 (0.0%)	08 (16.0%)	0.040 <sup>S</sup>
Absent	16 (100.0%)	42 (84.0%)	
Early arm edema			
Present	3 (18.75%)	20 (40.0%)	0.159 <sup>NS</sup>
Absent	13 (81.25%)	30 (60.0%)	
Hematoma			
Present	1 (6.25%)	7 (14.0%)	0.523 <sup>NS</sup>
Absent	15 (93.75%)	43 (86.0%)	

P-value was calculated by Chi square test, NS: Not significant, S: Significant, P-value was significant at <0.05.

**Table-7: Hospital stay of the patients with breast cancer (N=66)**

	Values		P-value
	Lumpectomy(BCS) (n=16)	Mastectomy(MRM) (n=50)	
Hospital stay (days) (Mean±SD)	6.06±0.85	17.70±4.70	<0.001 <sup>S</sup>

P-value was calculated by unpaired 't' test, NS: Not significant, S: Significant, P-value was significant at <0.05.

## DISCUSSION

Lumpectomy and mastectomy are the surgical treatment options for breast cancer. A lumpectomy is often called breast conserving (BCS) surgery because the goal is to remove the cancer and leave the healthy tissue behind. A mastectomy (MRM) is the removal of all the breast gland tissue, which usually includes the nipple as well. The main aim of this study was to evaluate the early postoperative morbidities following breast cancer surgery in women. This study provides a comprehensive characterization of a series of breast cancer from the point of view of outcome of different surgical methods. We have collected data from 66 patients who fulfilled all the eligibility criteria. Among these 66 cases, 16 (24.24%) underwent lumpectomy (BCS) and 50 (75.75%) underwent Modified Radical Mastectomy (MRM). The mean age of the participants in lumpectomy group was 37.69±10.31 years and 44.82±7.65 years in mastectomy group. Our findings were nearly similar to the report of Smrity Tiwari *et al.* from India in 2015 where they claimed the mean age of their study was 47.76 years. They found 37.2% patients in 41-50 years age group which was 38.4% in our counterpart. In case of mastectomy patients the mean age reported by Mizanur Rahman and his colleagues in 2014 was 44.7±9.82 which was also similar to our report. Certain early post-operative outcomes are analyzed in this study. Wound infection, seroma formation, hematoma and skin flap necrosis are most common cited complications in breast surgery within 30 postoperative day [11, 12]. In our study, we have found that wound infection was present 2(12.5%) and 12(24%) in lumpectomy (BCS) and mastectomy (MRM) respectively. Study carried out by Rostein *et al.* showed that wound infection was present 3%-19% in mastectomies which is nearly similar to our study [16]. In another study by Somers *et al.* showed that infection rate was 2%-14% in BCS which is also similar to our study [15].

In our study, seroma was found in 3(18.75%) and 10(20%) of patients in lumpectomy (BCS) and mastectomy (MRM) respectively which is statistically significant. Kumar *et al.* showed that formation of seroma occurs after mastectomy (MRM) with an incidence of 3% to 85% which is similar to our findings [17]. In an another study carried out by Vinton *et al.* showed that seroma occurred about 18% and 29% in BCS and MRM respectively which is lower than our study [18]. Randomized trials have shown that the use of electrocautery for dissecting flaps is significantly associated with increased seroma formation when

compared to that of scalpel dissection [24]. A randomized controlled trial by Purushotham demonstrated that sentinel lymph node biopsy is associated with significantly less seroma formation than that of conventional axillary dissection [25]. Iram Bokhary *et al.* showed that seroma was the most common complication following breast surgery [19]. It is so common that it is now believed to be a side effect of surgery rather than a complication. Associated morbidity in the form of prolonged drainage is not only troublesome to the patient but can also significantly impact treatment by delaying adjuvant therapy and increasing risk of infection [17]. A reoperation may necessary for cases of longstanding persistent seroma [20]. In our study, flap necrosis was present 0(0%) in lumpectomy (BCS) and 8(16.0%) in mastectomy (MRM). Incidence of flap necrosis is 6% to 18% in mastectomy where as 0% in lumpectomy which is similar to our study [19]. Multiple studies showed lymphedema occurs in 28% and 27.8% of patients following breast surgery particularly with axillary dissection [22, 5]. In our study it present in 20(40%) and 3(18.75%) in MRM and BCS respectively which is not statistically significant (P=0.159). Angelique *et al.* showed that haematoma occurred in 2% to 10% of cases of breast surgery [26]. In our study it was 1(6.25%) and 7(14%) in lumpectomy (BCS) and mastectomy (MRM) respectively which is not statistically significant. (p=0.523). Mean duration of hospital stay was 6.06 ± 0.85 and 17.70 ± 4.70 in lumpectomy (BCS) and mastectomy (MRM) group respectively showed in this study which was statistically significant. Patient's household income and education status plays important role regarding choice of the type of surgery of breast cancer. In this study lumpectomy (BCS) was done in 0(0%) in poor class, 4 (25%) in middle class and 12(75%) in affluent class whereas mastectomy (MRM) was done 14(28%), 30(60%) and 6(12%) respectively. This study also showed that lumpectomy (BCS) was performed in 1(6.25%), 3(18.75%), 9(56.25%) and 3(18.75%) patients of primary, SSC, HSC and Graduate and above level respectively whereas 17(34%), 21(42%), 8(16%) and 4(8%) in mastectomy (MRM) respectively. Lumpectomy (BCS) was done more in educated and economically solvent group.

### Limitations of the study

This was a single center study with small sample size. So, the study results might not be reflected in the whole community.

## CONCLUSION AND RECOMMENDATIONS

Surgery is the cornerstone of the multidisciplinary management of breast cancer. Surgical treatment of breast cancer has undergone a paradigm shift from radical to breast conservation. In our country, commonly performed surgical procedures are 1. Mastectomy (MRM) and 2. Lumpectomy (BCS), where MRM is more invasive and cosmetically disappointing than lumpectomy (BCS). This study is carried out in the department of surgical oncology in NICRH. The objective of this study is to observe the early postoperative outcomes of lumpectomy (BCS) and mastectomy (MRM) and to compare the early postoperative complications of these two surgical procedures. It was an observational and cross sectional study. Among 66 patients, 50 patients were done mastectomy (MRM) and 16 patients were done lumpectomy (BCS). According to this study, it is clearly found that seroma and flap necrosis is comparatively lower in lumpectomy (BCS) than mastectomy (MRM). Wound infection and arm oedema is also lower in lumpectomy but not statistically significant. Duration of hospital stay was significantly lower in lumpectomy group than mastectomy. Lumpectomy, which is also familiar as breast conserving surgery (BCS), results in less early postoperative complications and associated with favorable cosmetic outcomes than mastectomy (MRM) without compromising the treatment efficacy. Henceforth, we may conclude here that lumpectomy (BCS) should be widely accepted as the method of surgical treatment in justified cases of breast cancer.

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