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Outcome Following Breast Conservative Surgery for Early Breast Cancer at NICRH

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ABSTRACT

Introduction: *Breast cancer is diagnosed at an early stage as a result of population screening programs, which facilitate the possibility of organ preservation. One of the methods of breast cancer control is breast-conserving surgery (BCS). The present study will be done to assess the outcome following breast conservative surgery in early breast cancer.*

Methods: *This observational study was carried out in the Department of Surgical Oncology, National Institute of Cancer Research and Hospital, Mohakhali, Dhaka, from January 2018 to December 2019. A total of 46 patients were selected as study subjects by purposive non-randomized sampling technique. Data were analyzed statistically by using Statistical Package for Social Science (SPSS-26).*

Result: *In this study of 46 female patients with early breast cancer, the mean age was 43.35 ± 12.12 years, with most aged 31–40 years and predominantly married housewives. Infiltrating ductal carcinoma was the most common histological type (97.83%), and tumors were most frequently located in the upper outer quadrant (60.87%). The majority of tumors were moderately differentiated (86.96%) and measured 2–5 cm in size (T2; 80.43%). Cosmetic outcomes were favorable, with 65.22% showing excellent to good results by Breast Retraction Assessment, 41.30% by Nipple Deviation, and 56.52% by panel assessment.*

Conclusion: *Breast-conserving surgery for early breast cancer at NICRH demonstrated good overall outcomes. Most patients had no major complications, and minor issues like wound infection, hematoma, or seroma were managed conservatively. Cosmetic results were satisfactory in the majority, highlighting breast-conserving surgery as a safe and effective treatment choice for early-stage breast cancer.*

Keywords: *Breast Conservative Surgery, Early Breast Cancer, Breast Retraction Assessment, TNM staging*

I. INTRODUCTION

Breast cancer is a heterogeneous disease comprising multiple entities with different histological and molecular features characterized by distinctive clinical behaviors and responses to treatment. Thus, a central component of the treatment of breast cancer is the knowledge of its extent and biological properties (1). Breast cancer is the most prevalent cancer among women worldwide. As a result of improved treatment of early breast cancer, nearly three million women in the United States are breast cancer survivors, and these women are at risk

of breast cancer recurrence (2). Breast cancer is also most common among women in Bangladesh. It is the second leading cancer in women after cervical carcinoma. 22000 women were affected every year by breast cancer and 17000 (77%) of them died (3). A broad understanding of breast cancer can be achieved by identifying epidemiological and clinical parameters that impact incidence and survival. Various epidemiological factors impact both breast cancer risk and clinical prognosis, including sex, age, genetic background, previous chest radiotherapy, a positive family history, BRCA 1/2 mutations, breast density, obesity, oral contraceptive pills, and reproductive factors. Females have a greater than 100-fold higher risk of developing breast cancer than men (3,4). As a result of population screening programs and developments in diagnostics, breast cancer is increasingly diagnosed at an early stage. But in Bangladesh screening programmes for breast cancer are not well developed. In our country breast cancer detection rate at the early stage has increased due to increased general population awareness about breast cancer. About 75% of newly diagnosed cases are classified as early breast cancer (EBC) worldwide. In the NICRH outpatient department, about 45% of newly diagnosed breast cancer cases are early breast cancer (EBC). These facilitate the possibility of organ preservation; currently with an average rate of 70%. Early detection has brought patients the hope of full recovery, which is supported by increased knowledge of the molecular background of breast cancer and developments in histology and radio-and-drug therapy (5). The tumor stage is determined by the TNM staging system, where tumor size and local invasion (T), lymph node involvement (N), and presence of metastatic disease (M) are synthesized to evaluate the tumor stage. Factors associated with recurrence are stage, primary tumor size, presence of nodal involvement, hormone receptor status and human epidermal growth factor receptor 2 (HER 2) status, histologic grade and proliferative rate, vascular invasion, and response to primary therapy. Higher tumor grade or tumor stages are each associated with a poor prognosis. Both grade and stage are critical components to determining the proper clinical management for a particular breast cancer patient (6). Breast-conserving surgery (BCS), adjuvant chemotherapy with or without hormone therapy, and whole-breast radiotherapy (WBRT) have become the gold standard for the vast majority of patients with early-stage invasive breast cancer though no significant differences in local control, disease-free survival, or overall survival have been observed, even after 20 years of follow-up, indicating that survival in these patients is not dependent on the choice of mastectomy versus BCT. The main goal of BCS would be the resection of the tumor with adequate surgical margins while achieving a satisfactory cosmetic outcome and preserving glandular function. It is well known that good aesthetics have been associated with better psychological recovery and improved quality of life. The main factor influencing breast deformities following conventional BCS is the large volume of the resected specimen relative to the total breast volume producing asymmetry, retraction, and volume changes in the breast as well as fibrosis of the open cavity during healing (7,8). Patients treated with BCS followed by radiotherapy had an improved outcome compared to radical mastectomy alone. Specifically, local control, distant control, and overall survival were significantly better using the conservative approach (9). Therefore, the present study will be done to assess the outcome following breast conservative surgery in early breast cancer.

II. METHODS

This observational study was carried out in the Department of Surgical Oncology, National Institute of Cancer Research and Hospital, Mohakhali, Dhaka, from January 2018 to December 2019. Early breast cancer patients admitted to NICRH for breast conservative surgery were considered as the study population. A total of 46 patients were selected as study subjects by purposive non-randomized sampling technique. A complete medical history, physical examination, and the following investigations were performed for all patients: bilateral breast and axillary mammography, ultrasonography of the breasts and axilla, core biopsy of the breast lump, and immunohistochemistry (ER, PR, and HER2) following histopathological diagnosis. Additional evaluations included chest X-ray and whole abdomen ultrasonography. Ultrasound-guided FNAC was advised for palpable axillary lymph nodes; if positive, breast-conserving surgery (BCS) with axillary lymph node dissection up to level II was planned. For clinically and radiologically non-palpable nodes, sentinel lymph node biopsy (SLNB) was performed. Prerequisites for BCS included histopathological confirmation of cancer, imaging to assess lesion extent, a thorough clinical evaluation, and informed patient counseling. Data were analyzed statistically by using Statistical Package for Social Science (SPSS-26). The results were expressed as percentages and mean ± SD and were presented as tables and diagrams. Informed written consent was taken from the participants. Ethical clearance was taken from the Institutional Review Board.

Inclusion criteria:

- Diagnosed case of early breast cancer.

Exclusion criteria:

- Patients unwilling for BCS.
- Patients with locally advanced breast cancers.
- Recurrent carcinoma of the breast after BCT.
- Patients unwilling to follow-up at this hospital.
- EBC having an unplanned lumpectomy outside the NICRH.

III. RESULTS

Table 1: General characteristics of study population (n=46)

Parameter	Study subjects n (%)
Age(years)	
20-30	6(13.04)
31-40	22(47.83)
41-50	16(34.78)
51-60	2(4.35)
Mean±SD	43.35±12.12
Sex	
Female	46(100%)
Marital status	
Married	43(93.48%)
Unmarried	3(6.52%)
Occupation	
Housewife	24(52.17%)
Businessman	10(21.74%)
Service Holder	9(19.57%)
Student	3(6.52%)
Histological Type	
Ductal Infiltrating Type	45(97.83%)
Lobular Infiltrating Type	1(2.17%)

The age distribution showed that the majority of patients were between 31–40 years (47.83%), followed by 41–50 years (34.78%). The mean age of the study population was 43.35 ± 12.12 years. All patients were female (100%), with most being married (93.48%) and a small proportion unmarried (6.52%). In terms of occupation, the largest group comprised housewives (52.17%), followed by businessmen (21.74%), service holders (19.57%), and students (6.52%). Regarding the histological type, infiltrating ductal carcinoma was predominant, accounting for 97.83% of cases, while only one patient (2.17%) had the infiltrating lobular type. [Table 1]

Table 2: Quadrant-wise distribution of tumor location (n=46)

Tumor Location	**Number of Patients (n)**	**Percentage (%)**
Upper Outer Quadrant	28	60.87%
Upper Inner Quadrant	6	13.04%
Lower Outer Quadrant	8	17.39%
Lower Inner Quadrant	3	6.52%
Central	1	2.17%

In present study, Upper outer quadrant was involved in 28(60.87%) subjects, upper inner in 6(13.04%), lower outer in 8(17.39%), lower inner in 3(6.52%) and central in 1(2.17%) study subjects. [Table 2]

Table 3: Distribution of study subjects according to tumor differentiation (n=46)

Tumor Differentiation	Number of Patients (n)	Percentage (%)
Well Differentiated	5	10.87%
Moderately Differentiated	40	86.96%
Poorly Differentiated	1	2.17%

Among the study subjects, 5(10.87%) were well-differentiated tumors, 40 (86.96%) were moderately differentiated tumors and 1 (2.17%) were poorly differentiated tumors. [Table 3]

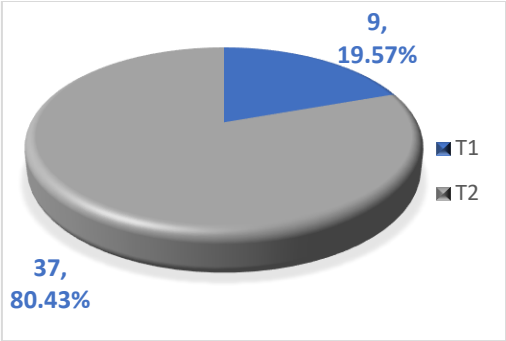

Figure 1: Distribution of study subjects according to tumor size (n=46)

In 9(19.57%) cases tumor size was 0.5 to 2cm (T1) and in 37 (80.43%) cases tumor size was 2-5 cm (T2) in diameter.

Table 4: Distribution of study subjects according to surgical plan (n=46)

Variable	Study group
BCS with chemotherapy and radiotherapy ± hormone therapy	44(95.66%)
Cavity shaving following BCS with chemotherapy and radiotherapy ± hormone therapy	1(2.17%)
Mastectomy after BCS with chemotherapy and radiotherapy ± hormone therapy	1(2.17%)

n= number of study subjects

After BCS every patient has to take radiotherapy as it is mandatory. Margin-positive subjects were treated with cavity shaving (1; 2.17%) and mastectomy (1;2.17%) followed by chemotherapy and radiotherapy ± hormone therapy. [Table 4]

Table 5: Distribution of study subjects according to cosmetic outcome (n=46)

Variable	Score	Study group
Breast Retraction Assessment (BRA)		
Excellent to good	<3.1 cm	30(65.22%)
Fair	3.1-6.5 cm	15(32.61%)
Poor	>6.5 cm	1(2.17%)
Nipple Deviation (ND)		
Excellent to good	Difference of <5%	19(41.30%)
Fair	Difference of 5-10%	13(28.26%)
Poor	Difference of >10%	14(30.43%)
Panel assessment		
Excellent to good	Excellent: no visible difference between two breasts;9-10 Good: slight difference; score 7-8	26(56.52%)
Fair	Obvious differences but no major distortion; score 4-6	16(34.78%)
Poor	Major distortion; score <4	4(8.69%)

n= number of study subjects

Of the 46 patients assessed using BRA, the scores were good to excellent, fair, and poor 30(65.22%), 15(32.61%), and 1(1%) respectively. ND scored 19(41.30%) as good to excellent, 13(28.26%) as fair and 14(30.43%) as poor. Using panel assessment 26(56.52%) scored good to excellent, 16(34.78%) scored fair and 4(8.69%) scored poor. [Table 5]

IV. DISCUSSION

The present study was undertaken to assess the outcome following breast conservative surgery for early breast cancer. For this study, a total number of 46 female patients with early breast cancer who meet the inclusion criteria were selected. The outcome of the study was assessed by using the modified criteria of Kirkaldy-Willis. The results of the current study demonstrate that most of the early breast cancer patients diagnosed within 31 years to 40 years (48%) married population. Maślach et al. (10) and Chauhan and Sharma (11) also showed similar findings. But Wang et al. (12), Corradini et al. (2019) and Wang (2019) demonstrate that most of the patients were within 50 years to 60 years. In the present study majority of study subjects came from middle and lower socioeconomic conditions and rural areas. But Maślach et al. (10) reported that women living in urban areas were affected more than rural areas. In the present study, the upper and outer quadrant was involved more than the lower quadrant differentiated. Almost similar findings were observed by Chauhan and Sharma (11). Margin-positive subjects were treated with cavity shaving and mastectomy followed by chemotherapy and radiotherapy ± hormone therapy. Almost similar findings were found by Chauhan and Sharma (11). In the present study cosmetic outcomes following breast-conserving surgery were assessed using a combination of subjective and objective methods. The subjective method used a panel of members from different backgrounds to assess overall cosmesis. The objective methods, which mainly compared the position of the nipple, were easy to reproduce but did not take into account skin changes and gave poor assessment of cosmesis for lower quadrant tumors. In the present study good to excellent results were found in 56.52% of the patients by the panel assessment. Similar findings were observed by Charfare et al. (13). The two objective methods of cosmetic assessment (BRA and ND) that were used to assess upward retraction of nipple were a very good determinant of cosmetic outcome and were easy to reproduce according to Fujishiro et al. (14). Furthermore, evaluation of nipple position had also been shown to be moderately representative of overall cosmetic result (13). BRA is a two-dimensional measurement of nipple position and some cosmetic factors such as volume, shape, or skin changes cannot be accurately assessed (14). This is probably the reason why BRA shows a better cosmetic outcome when compared with subjective assessment by panel members. In the present study, only one (1%) patient was deemed to have a poor cosmetic outcome using BRA compared with 4 (8.69%) using panel assessment. Similar findings were observed by Charfare et al. ND scores majority had good to excellent results in the present study. Similar findings were observed by Charfare et al. (13).

Limitations of The Study

Although optimal care was tried by the researcher at every step of the study, there were some limitations:

- The study was conducted in a selected hospital. So, the study population might not represent the whole community.
- The sample was taken purposively. So, there may be a chance of bias which can influence the results.
- The study and follow-up period was short in comparison to other studies.
- Small sample size.
- Long queue for radiotherapy.

V. CONCLUSION

Breast-conserving surgery for early breast cancer at NICRH demonstrated good overall outcomes. Most patients had no major complications, and minor issues like wound infection, hematoma, or seroma were managed conservatively. Cosmetic results were satisfactory in the majority, highlighting breast-conserving surgery as a safe and effective treatment choice for early-stage breast cancer.

VI. RECOMMENDATION

breast-conserving surgery should be encouraged for eligible early breast cancer patients due to its safety, effective disease control, and favorable cosmetic outcomes. Continued emphasis on early detection and proper patient selection is recommended to further improve surgical and aesthetic results.

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