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Breast Conserving Surgery: An Overview at a Tertiary Cancer Centre

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ABSTRACT

Background

Breast-conserving surgery with radiation therapy is the standard approach for early breast cancer. It provides much better cosmetic effects as well as the same level of overall survival as compared to a mastectomy. Despite strong global evidence supporting breast-conserving surgery, it is less preferred in Nepal, and its outcome in the Nepali context is poorly documented.

Objective

To assess the oncological outcomes of breast-conserving surgery at a tertiary cancer centre in Nepal.

Method

This hospital-based retrospective cohort study was done in Bhaktapur Cancer Hospital, Nepal, from 2012 to 2018. All the breast cancer patients who underwent breast-conserving surgery were included in the study and were followed up for at least 5 years postoperatively till 2024 with clinical examination and radiological investigations. The statistical analysis was done using SPSS version 22. The measurement data with a normal distribution were expressed as the mean ± standard deviation.

Result

The study included 100 patients, with a median age of 43 years (range 25-73 years), and a mean tumor size of 26.34 ± 8.6 mm. The mean hospital stay was 3.9 ± 1.08 days, and 94% patients had no complications. Histologically, invasive carcinoma of no special type was the most common. Five-year disease-free survival and five-year overall survival rate were 96% and 97% respectively.

Conclusion

Our study concluded that Breast Conserving Surgery has a shorter hospital stay, fewer complications, and good oncological outcomes, so it is a simple and feasible technique for patients with early breast cancer.

KEY WORDS

Breast cancer, Breast-conserving therapy, Breast surgery, Radiotherapy

INTRODUCTION

Breast cancer is the most common cancer in women, which accounts for 25.1% of all cancers. In 2012 A.D, 1,671,149 new cases of breast cancer were identified, and 521,907 deaths occurred due to breast cancer worldwide.[1] There are numerous risk factors, such as sex, age, estrogen, family history, gene mutations, and unhealthy lifestyle, which can increase the risk of developing breast cancer.[2] Breast cancer predominantly occurs in women, and the number of cases is 100 times more common in women than in men.[3] Early diagnosis and treatment of breast cancer (BC) are important for a good prognosis. Breast-conserving surgery (BCS) is a widely accepted form of treatment in patients with breast cancer.[4] Oncoplastic BCS was introduced by Audretsch in the 1990s when he first described the technique of reconstructing a partial mastectomy defect using plastic surgery methods as a further refinement of breast conservation, avoiding mastectomy.[5]

The two main goals of the surgeon when performing BCS are to obtain tumor-free margins and achieve a good cosmetic outcome by keeping the amount of healthy breast tissue excision as low as possible. To reduce the risk of local recurrences, conservative procedures imply a postsurgical treatment with radiotherapy, which in the majority of cases is applied to the whole breast with a dosage varying from 50-60 Gy, with or without a boost on the scar.[6-8]

BCS has been proven to be equally effective as mastectomy in early breast cancer patients in terms of local tumor control, recurrence-free survival (RFS), and overall survival.[9] But, BCS is not commonly done in Nepal due to the limited access to radiotherapy, or the patient's desire to remove the breast to minimize the risk of local recurrence.[10] The main objective of our study was to assess the oncological outcomes of breast conserving surgery at a tertiary cancer centre in Nepal.

METHODS

This was a retrospective cohort study of breast cancer patients at Bhaktapur Cancer Hospital, Nepal, from 2012 to 2018 A.D. A Convenient sampling method was used, and 100 cases were enrolled in the study. The data were collected based on a preformed performa from hospital records. Ethical approval was taken from the Nepal Health Research Council (Reg. no. 527/2023). All the patients who underwent breast-conserving surgery during the study period were enrolled in the study, and those who were lost to regular follow-up during the study period were excluded from the study.

All the patients underwent lumpectomy with axillary lymph node dissection. A 2 cm margin of normal tissue was removed along with the tumor. Metallic clips were placed on the pectoralis muscle before the closure of the defect. A drain was placed both in the tumor site and the axilla, as shown in figure 1. All the patients were subjected to adjuvant radiotherapy 40Gy in 15 fractions, followed by 4 fraction boost doses. Triple negative patients were given neoadjuvant chemotherapy based on Adriamycin and Cyclophosphamide for 6 cycles. Patients with positive axillary nodes were treated with an adjuvant chemotherapy regimen of Adriamycin, Doxurubicin, and Cyclophosphamide. Estrogen receptor-positive patients were treated with Tamoxifen 5 mg for 5 years. All the patients were regularly followed for at least five years with clinical examination and radiological investigations.

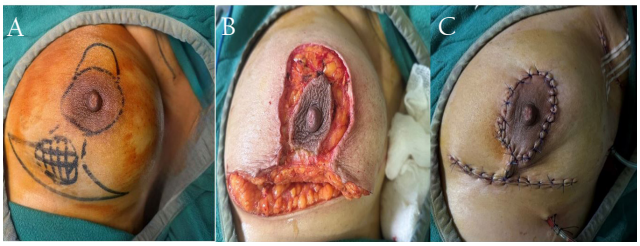

Figure 1. Intraoperative pictures of Breast Conserving Surgery A. marking for tumor removal, B. after tumor removal, C. after reconstruction.

Data were entered into an Excel sheet, and the analysis was done using the Statistical Package for Social Sciences (IBM SPSS Version 22). The measurement data with a normal distribution were expressed as the mean ± standard deviation.

RESULTS

The median age of the patients was 43 years (range 25-73 years). All the patients were female, and the majority of them were premenopausal (75%). The mean tumor size was 26.34 mm (SD 8.6 mm). Baseline characteristics of patients are shown in table 1. Tumors were commonly found in the left breast in sixty-three (63%) patients, and in the upper outer quadrant in forty-two (42%) patients. Most of the patients had no postoperative complications (94%). Four patients developed seroma, one patient had limb edema, and one patient had hematoma.

Invasive carcinoma of no special type (NST) was the most common (89%) histologically, and metaplastic carcinoma was seen in one patient. Most of the tumors were grade II (54%). Estrogen receptor positivity was seen in 78 patients, and four patients were triple negative. Tumor characteristics are shown in table 2.

One (1%) patient developed locoregional recurrence at 1 year, and five (5%) patients developed locoregional recurrence at five years. Five-year disease-free survival was seen in 96% patients and five-year overall survival was seen in 97% patients, as shown in table 3.

Table 1. Baseline characteristics (n=100)

Characteristics	Number (%)
Age (years)	
Median (range)	43 (25 - 73)
Gender	
Female	100 (100)
Male	0
Mean age at menarche ± standard deviation (years)	14.02 ± 1.101
Menopausal status	
Premenopausal	75 (75)
Postmenopausal	25 (25)
Family history	
Yes	20 (20)
No	80 (80)
Duration of tumor (days)	
Median (range)	28 (14 - 90)
Tumor laterality	
Right	37 (37)
Left	63 (63)
Mean tumor size ± standard deviation (mm)	26.34 ± 8.6
Tumor site	
UOQ	42 (42)
LOQ	37 (37)
UIQ	10 (10)
LIQ	11 (11)
Axillary lymph node status	
Positive	31 (31)
Negative	69 (69)
Mean hospital stay ± standard deviation (days)	3.9 ± 1.08
Complications	
No	94(94)
Yes	6(6)
Seroma	4
Hematoma	1
Limb edema	1

Table 2. Tumor characteristics (n = 100)

Characteristics	Number (%)
Tumor grade	
Grade I	3 (3)
Grade II	54 (54)
Grade III	43 (43)
Tumor histology	
Invasive carcinoma of NST	89 (89)
Carcinoma with medullary features	9 (9)
Mixed invasive carcinoma of NST & Invasive lobular carcinoma	1 (1)
Metaplastic carcinoma	1 (1)
Receptor status	
ER positive	78 (78)
PR positive	67 (67)
Her2 positive	40 (40)
Triple negative	4 (4)

Table 3. Post-operative prognosis

Characteristics	Number (%)
Locoregional recurrence at 1 year	1 (1)
Locoregional recurrence at 5 year	5 (5)
Five years disease free survival	96 (96)
Five years overall survival	97 (97)

DISCUSSIONS

Breast-conserving surgery is an effective alternative for early breast cancer patients, offering comparable oncological outcomes to mastectomy, while preserving the cosmetic appearance of the breast. The median age of patients in our study was 43 years, which is similar to the Indian report, but younger than the patients in Western countries, where the median age is often around 60-65 years.[11-16] Younger age at presentation in women in the Indian subcontinent with breast cancer is more likely to be due to the differences in the population structure rather than major differences in the tumor biology. The majority of the patients were premenopausal (75%), which is consistent with the younger age distribution observed in our study. The mean tumor size of 26.34 mm is in contrast to the 15-20 mm in most Western reports of primary BCS.[17-19] This suggests the relatively late presentation, possibly from a lack of public awareness and no population-based breast cancer screening programs. All the tumors in this study were unicentric, but BCS can be done in multicentric breast cancer with good results regarding disease-free survival and recurrence.[20] In our study, invasive carcinoma of no special type (NST) was the most common type histologically (89%), which is similar to Veronesi et al.[4]

The high prevalence of estrogen receptor positivity (78%) and progesterone receptor positivity (67%) in our study is similar to the 17-37% incidence of ER or PR negative tumors in Western studies, and it suggests a favorable response to adjuvant endocrine therapy.[21,22] The incidence of triple-negative breast cancer in our study was low (4%), which is usually associated with poorer prognosis and limited treatment options.

The adequacy of surgery can be judged by the incidence of positive surgical margins and the median number of axillary nodes dissected. In our study, positive resection margins were found in only 4% patients, and a median of 11 axillary nodes were dissected, which is comparable to other studies.[23-25] Postoperative complications were

minimal, with seroma being the most common, affecting 4% of patients. These findings are consistent with Van et al. indicating low complication rates with BCS compared to mastectomy.[8] The relatively low complication rate underscores the feasibility of BCS in a resource-limited setting like Nepal, where access to advanced surgical techniques and postoperative care may not be possible. The mean hospital stay of 3.9 days in our study indicates a shorter hospital stay, which can reduce healthcare costs and optimize resource allocation.

Our study showed a locoregional recurrence in five (5%) patients at five years, which is lower than Bekkum et al.[26] Some previously published data reported a locoregional recurrence risk of up to 30%.[27-29] Of these five patients, three patients had local recurrences only, one had a regional recurrence, and one patient had local as well as regional recurrence. All the local recurrence patients underwent surgery, either wide excision or mastectomy. The patient with regional recurrence underwent excision of the recurrence. Contralateral breast involvement was seen in only two (2%) patients. The recurrent tumor commonly involved the upper outer quadrant of the breast.

The five-year disease-free survival rate of 96% and the five-year overall survival rate of 97% are comparable to those reported in Blichert et al.[9] These results indicate the efficacy of BCS combined with adjuvant therapy in achieving favourable long-term outcomes in early breast cancer patients.

The potential limitation of this study is its retrospective design, which may introduce bias, and a small sample size.

CONCLUSION

Breast-conserving surgery is a feasible and effective treatment option for early-stage breast cancer patients. The excellent oncological outcomes, along with the low complication rates, support BCS as a standard treatment option for early breast cancer.

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