

Assessment of Treatment Outcomes in Locally Advanced Breast Cancer Cases Managed by Neoadjuvant Chemotherapy versus Non Neoadjuvant Chemotherapy in a Tertiary Care Centre

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Abstract:

Background: Locally advanced breast cancer (LABC) remains a common presentation among Indian women. Neoadjuvant chemotherapy (NACT) has become an integral component of multimodality treatment due to its ability to downstage tumors and improve surgical outcomes.

Objectives: To compare treatment outcomes among patients with locally advanced breast cancer managed with neoadjuvant chemotherapy followed by surgery versus upfront surgery followed by adjuvant chemotherapy.

Materials and Methods: A combined retrospective and prospective observational study was conducted in a tertiary cancer care centre over 18 months. A total of 120 patients with Stage IIIA–IIIC breast cancer were included. Seventy patients received NACT followed by surgery, while fifty patients underwent upfront surgery followed by adjuvant chemotherapy. Clinical response, pathological response, surgical outcomes, recurrence, disease-free survival (DFS), and overall survival (OS) were analyzed.

Results: The mean age was 49.8±10.6 years. Clinical response to NACT was observed in 80% of patients. Pathological complete response (pCR) was achieved in 17.1% of patients. Breast conservation surgery was feasible in 20% of patients in the NACT group compared to 4% in the upfront surgery group (p=0.01). Axillary nodal down staging occurred in 58.6% of NACT patients. Two-year DFS and OS were 84.3% and 91.4% respectively in the NACT group compared to 74.0% and 84.0% in the upfront surgery group.

Conclusion: Neoadjuvant chemotherapy significantly improves operability, breast conservation rates, and nodal down staging in patients with locally advanced breast cancer. Patients achieving pathological complete response demonstrated superior survival outcomes.

Keywords: Breast Cancer, Neoadjuvant Chemotherapy, Locally Advanced Breast Cancer, India, Pathological Complete Response.

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Introduction

Breast cancer is the most common malignancy among women worldwide. According to GLOBOCAN 2022, approximately 2.3 million new cases and 666,000 deaths were reported globally.

In India, breast cancer accounts for nearly 28% of all female cancers and remains the leading cause of cancer-related mortality among women.

Despite advances in screening and awareness, a significant proportion of Indian women continue to present with locally advanced disease. Studies from various tertiary care centres in India report that nearly 50–60% of patients present with Stage III disease. Locally advanced breast cancer includes

Stage IIIA, IIIB, and IIIC disease according to the American Joint Committee on Cancer (AJCC) staging system. Treatment requires a multidisciplinary approach involving systemic therapy, surgery, radiotherapy, and endocrine therapy when indicated.

Neoadjuvant chemotherapy offers several advantages including reduction in tumor size, increased rates of breast conservation, assessment of tumor response, and potential improvement in survival. Pathological complete response has emerged as an important prognostic marker, particularly in HER2-positive and triple-negative breast cancers.

Aim of this study is to evaluate treatment outcomes among patients managed with NACT compared with upfront surgery in a tertiary care setting.

Materials and Methods: Combined retrospective and prospective observational study over 18 months period in the Department of Surgical Oncology and Government Cancer Care Centre, Government Medical College, Kadapa over 120 patients.

Inclusion Criteria: Female patients with Stage IIIA–IIIC breast cancer. Histologically confirmed invasive ductal carcinoma. Patients receiving definitive treatment at the study centre. Informed consent obtained.

Exclusion Criteria: Male breast cancer, Carcinoma in situ, Non-epithelial breast malignancies and Metastatic disease at diagnosis.

Treatment Protocol: NACT Group: Doxorubicin 60 mg/m², Cyclophosphamide 600 mg/m², Followed by Paclitaxel 80 mg/m², HER2-positive patients additionally received trastuzumab.

Surgical Procedures: Modified Radical Mastectomy (MRM), Breast Conserving Surgery (BCS)

Response Assessment: RECIST 1.1 criteria were used. Complete Response (CR), Partial Response (PR), Stable Disease (SD), Progressive Disease (PD).

Statistical Analysis: SPSS Version 25 was used. Chi-square test, Student t-test, Kaplan-Meier survival analysis, P value <0.05 considered significant.

Results

A total of 120 patients were included. 70 patients (58.3%) received NACT. 50 patients (41.7%) underwent upfront surgery.

Table 1: Baseline Characteristics

Variable	NACT (n=70)	Surgery First (n=50)
Mean Age	48.9±9.8	51.1±11.2
Premenopausal	60%	56%
Stage IIIA	37.1%	42%
Stage IIIB	45.7%	40%
Stage IIIC	17.2%	18%

Table 2: Response to Neoadjuvant Chemotherapy

Response	Number (%)
Complete Response	8 (11.4)
Partial Response	48 (68.6)
Stable Disease	10 (14.3)
Progressive Disease	4 (5.7)
Overall response rate	80%.
Tumor Down staging	
Mean tumor size decreased from 6.1 cm to 3.2 cm (p<0.001).	
Axillary nodal down staging occurred in 58.6%.	

Table 3: Surgical Outcomes

Outcome	NACT (n=70)	Surgery First (n=50)
MRM	80%	96%
BCS	20%	4%
Margin Negative	95.7%	92%
Breast conservation rates were significantly higher following NACT.		

Table 4: Pathological Findings

Parameter	NACT (n=70)	Surgery First (n=50)
pCR	17.1%	NA
Node Negative	54.3%	36%
LVI Positive	20%	32%

Table 5: Post-Operative Complications

Parameter	NACT (n=70)	Surgery First (n=50)
Seroma	8.6%	10%
Wound infection	5.7%	8%
Flap necrosis	2.8%	4%
No significant difference between groups.		

Table 6: Survival Outcomes

Outcome	NACT (n=70)	Surgery First (n=50)
Local Recurrence	5.7%	10%
Distant Metastasis	11.4%	18%
2-Year DFS	84.3%	74%
2-Year OS	91.4%	84%
Patients achieving pCR demonstrated significantly improved disease-free survival.		

Discussion

The present study demonstrates the clinical benefits of neoadjuvant chemotherapy in the management of locally advanced breast cancer. The overall response rate of 80% observed in our study is comparable with previous international and Indian studies reporting response rates ranging from 65% to 85%. Pathological complete response was achieved in 17.1% of patients, which is consistent with reports from NSABP B-18 and B-27 trials. A major benefit observed was increased breast conservation. Breast-conserving surgery was feasible in 20% of patients receiving NACT compared with only 4% among patients undergoing upfront surgery. Axillary nodal downstaging was observed in 58.6% of patients, supporting previous studies demonstrating the role of NACT in reducing nodal disease burden.

The NACT group also demonstrated lower recurrence rates and superior disease-free and overall survival. The findings emphasize the importance of multidisciplinary management and early referral for systemic therapy in locally advanced breast cancer.

Limitations: Single-centre study, relatively short follow-up, Limited sample size, Molecular subtype-specific outcomes were not separately analyzed.

Conclusion

Neoadjuvant chemotherapy is an effective treatment strategy for locally advanced breast cancer. It significantly improves operability,

facilitates breast conservation, increases nodal down staging, and is associated with favorable survival outcomes.

Pathological complete response remains a strong predictor of improved prognosis.

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