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Is Breast Conserving Surgery a Viable Option for Non-Inflammatory T3/T4 Breast Cancer? A Retrospective Cohort Study of Surgical Feasibility and Oncological Safety

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Abstract

Breast-conserving surgery (BCS) for locally advanced breast cancer remains a controversial approach, primarily due to concerns regarding its technical feasibility and oncological safety. Our retrospective analysis of prospectively maintained data reveled that BCS is feasible with low rates of positive margins (2.6%), margin re-excision or conversion to mastectomy (1.3%). Our data demonstrated a superior OS of 95%, no isolated local recurrences, and a systemic recurrence rate of 13%, indicating that systemic, rather than, local control is the driver of disease prognosis. We recommend considering BCS as a viable treatment option after neoadjuvant systemic therapy (NAST) for those patients.

Introduction

Historically, mastectomy has been the preferred surgical intervention for locally advanced breast cancer (LABC), while BCS is now an area of debate. On one hand, the advanced tumor stage raises the concern about ability of BCS to achieve negative surgical margins and its safety in terms of disease recurrence and survival outcomes. On the other hand, the growing utilization of NAST resulting in significant downstaging, coupled with the development of oncoplastic breast-conserving techniques allowing aesthetically acceptable breast conservation, has rendered BCS an increasingly appealing option for both patients and surgeons.

Methodology

This retrospective cohort study aims to evaluate the surgical feasibility and oncological safety of BCS for non-inflammatory, non-multicentric T3/T4 non-metastatic breast cancer using prospectively maintained data. We identified 75 female patients diagnosed between 2017 and 2024. Our analysis encompassed clinico-pathological characteristics, treatment modalities, feasibility factors including surgical margins, rates of margin re-excision, conversion to mastectomy and cosmetic outcome. And oncological outcome analysis included pathologic complete response (PCR) or down-staging to a lower tumor stage after NAST, disease recurrence and overall survival.

Result

Out of the 75 patients, 43 (57%) had a T3 lesion, and 32 (43%) had a T4a-c lesion. The mean age was 52 years. Most of the patients had an invasive ductal histology (95%) of high grade (71%), and node-positive disease (60%). Luminal subtype was 41%, while 37% were triple negative (TN) and 21% were HER2neu-positive. BCS was associated with positive surgical margins in 2 patients (2.6%); One underwent margin re-excision (1.3%), and the other (1.3%) was converted to a mastectomy.

Most of the patients received NAST (92%) and adjuvant radiotherapy (93%). PCR was observed in 31 (45%) patients, while 35 (50%) achieved down-staging to a smaller tumor size, including all patients with TN or HER2-positive disease (Bar chart). On multivariate analysis, TN (70%) and HER2-positive (50%) were significantly more likely to achieve PCR, compared luminal subtype (8%) (P<0.001). With an average follow-up of 31 months, our cohort demonstrated an overall survival rate of 95%. Tumor recurrence was observed in 10 (13%) patients, mostly systemic (11%). No isolated local recurrences were identified. Notably, systemic recurrences were predominantly associated with HER2-positivity (50%) and high grade (60%) and lack of PCR (78%). However, this did not correlate to statistical significance.

Table 2

Neoadjuvant and adjuvant treatment data

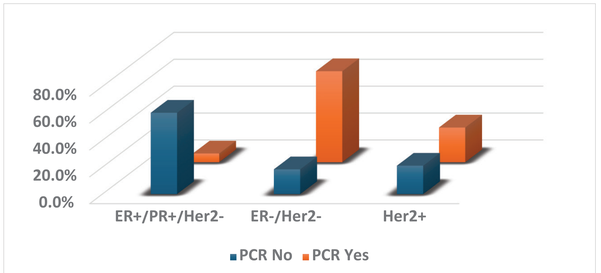
Factors	Results
NAST	
• Chemo	63 (84.0%)
• HT	6 (8.0%)
• No	6 (8.0%)
Adjuvant CT	
• Yes	20 (26.7%)
• No	55 (73.3%)
Adjuvant HT	
• Yes	39 (52.0%)
• No	36 (48.0%)
Adjuvant anti HER2	
• Yes	16 (21.3%)
• No	59 (78.7%)
Adjuvant Radiotherapy	
• Yes	70 (93.3%)
• No	5 (6.7%)

Table 7

Recurrence rates stratified by tumor subtype, tumor grade, and PCR

	Recurrence		P
	No	Yes	
Tumor Grade			
G1	3	0	.478
	5.0%	0.0%	
G2	12	3	
	20.0%	33.3%	
G3	45	6	
	75.0%	66.7%	
Tumor subtypes			
ER+/PR+/Her2-	23	2	.074
	38.3%	22.2%	
ER-/Her2-	26	2	
	43.3%	22.2%	
Her2+	11	5	
	18.3%	55.6%	
PCR			
Yes	29	2	.130
	48.3%	22.2%	
No	31	7	
	51.7%	77.8%	

Pathological complete response stratified by biological tumor subtype



Discussion

BCS for T3/T4 non- inflammatory breast cancer after NAST is associated with very low rates of positive surgical margins and conversion to mastectomy, while maintaining cosmetically acceptable outcomes after oncoplastic surgery, including level 1 and 2 techniques, therapeutic reduction mammoplasty, and, less frequently, chest wall perforator flap reconstruction. Isolated local recurrence was not identified, and most recurrences were systemic, suggesting failure of systemic rather than local control. The association between local recurrence and HER2-positive subtype, high tumor grade, and lack of PCR highlights the impact of tumor biology on disease prognosis. Our cohort has demonstrated superior OS compared to historically poorer outcomes of LABC, owing to improved systemic and targeted therapy, and underscoring the lack of significant impact of tumor size on patients' survival. Our study aligns with previous studies showing that the type of surgery (mastectomy versus BCS) does not impact survival in this group of patients.

Conclusion

BCS for non-inflammatory T3/T4 breast cancer is surgically feasible and oncologically safe after NAST, especially in patients who achieve PCR or downstaging. Tumor biology, not tumor size is the key determinant of survival outcomes. Therefore, BCS should be considered as a viable treatment alternative to mastectomy in these patients.

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