Preoperative Assessment for the Omission of Sentinel Node Biopsy in Luminal/HER2-Negative Breast Cancer in Low-Resource Settings

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Introduction

Breast cancer is the second most common malignancy in women worldwide after non-melanoma skin cancer and remains the leading cause of cancer-related mortality in this population[1]. In Brazil, approximately 74,000 new cases are projected through 2025[2]. Sentinel lymph node biopsy is the standard axillary management for early-stage breast cancer. However, emerging evidence suggests that patients with negative preoperative axillary involvement may not benefit significantly from axillary surgery[3].

Objective

The aim of this study was to determine if the preoperative assessment can identify patients with absent or low axillary tumor burden who could safely omit sentinel lymph node biopsy during surgical treatment of luminal/HER2-negative breast cancer.

Methods

We conducted a prospective observational study at a public university hospital operating within the Brazilian National Health System (SUS). Eligible candidates were women with early-stage (T1–T2 N0) luminal/HER2-negative breast cancer who exhibited no clinical or ultrasonographic evidence of axillary disease on preoperative assessment and subsequently underwent sentinel lymph node biopsy. Histopathological findings from surgery specimens were then correlated with the clinicopathological parameters during preoperative assessment.

Table 1: Descriptive analysis of the clinical characteristics of the women.

Clinicopathologic Characteristics	n (%)
Menstrual Status	
Premenopausal	4 (10,0%)
Postmenopausal	36 (90,0%)
Tumor size (preoperative)	
< 2 cm (T1)	23 (57,5%)
2 to 5 cm (T2)	17 (42,5%)
Age	
≥ 60 years	25 (62,5%)
< 60 years	15 (37,5%)
Luminal subtype	
A	29 (72,5%)
B	11 (27,5%)
Histological grade	
I	13 (32,5%)
II or III	27 (67,5%)
Multifocality	
No	34 (85,0%)
Yes	6 (15,0%)
Sentinel lymph nodes removed	
< 3	17 (42,5%)
≥ 3	23 (57,5%)

Results

Among the 40 participants, 12 (30%) exhibited axillary involvement, and none demonstrated extensive axillary disease (≥ 4 positive lymph nodes). The absence of tumor lymphovascular invasion was significantly associated with a negative axillary status (OR = 9.286; p = 0.018). Age ≥ 60 years was also associated with a negative axilla, although at a 10% significance level (OR = 3.5; p = 0.082).

Conclusion

Negative preoperative axillary assessment is an effective strategy for selecting patients without extensive axillary disease in luminal/HER2-negative breast cancer. The absence of lymphovascular invasion and age ≥ 60 years increase the likelihood of a negative axilla. Clinicopathological parameters in early-stage luminal/HER2-negative breast cancer appear to provide sufficient data for selecting candidates for omission of sentinel lymph node biopsy, especially when the presence of low axillary tumor burden does not influence systemic therapy choice.

Keywords: Sentinel lymph node biopsy; Breast cancer; Invasive ductal carcinoma; Sentinel lymph node; Lymphatic metastasis.

Table 2: Logistic regression results for estimating the probability of a negative axillary status.

Clinicopathologic Characteristics	Univariate logistic model		
	OR	IC95%	P value (Wald)
Menstrual Status			
Premenopausal	0,385	(0,048; 3,113)	0,371
Postmenopausal	1	-	-
Tumor size (preoperative)			
< 2 cm (T1)	0,952	(0,242; 3,748)	0,944
2 to 5 cm (T2)	1	-	-
Age			
≥ 60 years	3,500	(0,854; 14,342)	0,082
< 60 years	1	-	-
Luminal subtype			
Luminal A	0,422	(0,076; 2,341)	0,324
Luminal B	1	-	-
Histological grade			
I	1,667	(0,365; 7,607)	0,510
II or III	1	-	-
Lymphovascular invasion			
No	9,286	(1,475; 58,467)	0,018
Yes	1	-	-
Multifocality			
No	0,418	(0,043; 4,024)	0,450
Yes	1	-	-

*n=40 patients; CI, confidence interval; BMI, body mass index; OR, odds ratio.

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