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Evaluating Prognosis According to Axillary Surgery in Breast Cancer Patients with Isolated Internal Mammary Lymph Node Metastasis (cN2b): A Retrospective Cohort Study

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Introduction

The internal mammary lymph nodes (IMLNs) are one of the regional lymphatic basins in breast cancer. While IMLN metastasis is frequently observed in patients with concurrent axillary lymph node (AXLN) involvement (cN3b), isolated IMLN metastasis without AXLN involvement (cN2b) is relatively rare[1], and the optimal axillary surgical strategy remains unclear.

This study aimed to investigate the clinicopathological features and prognosis of patients with isolated IMLN metastasis (cN2b), and to evaluate the necessity of axillary lymph node dissection (ALND).

Methods and Materials

Patient Selection:

We retrospectively analyzed primary breast cancer patients who underwent surgery between Jan 2007 and Dec 2021. Inclusion required cytological confirmation of IMLN metastasis before surgery. Exclusion criteria included clinical T4 tumors, supraclavicular or distant metastases, and bilateral disease. Some cases met multiple exclusions.

Evaluation Method for Regional Lymph Node Metastasis:

At our institution, AXLNs are routinely assessed using US. Nodes are considered suspicious for metastasis when there is disappearance of the hilum or cortical thickening >3 mm. IMLNs are rarely visualized on US; therefore, any visible IMLN is regarded as suspicious. In addition, MRI is used to assess contrast-enhancing IMLNs, and PET-CT is performed in clinical Stage II or higher cases to evaluate FDG uptake in regional lymph nodes. If metastasis to AXLNs or IMLNs is suspected based on imaging studies, US-guided fine-needle aspiration cytology was performed. Nodes confirmed malignant on cytology were diagnosed as metastatic.

For patients with cN2b disease, the axillary surgical approach was determined individually for each case.

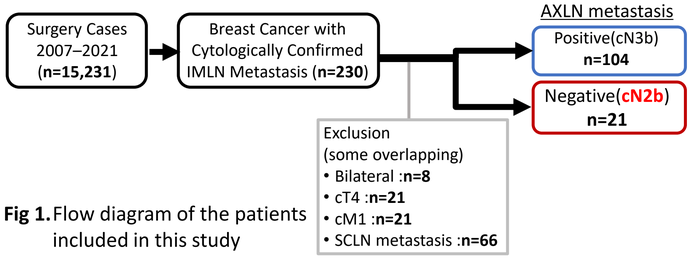


Fig 1. Flow diagram of the patients included in this study

Results

Table1. Comparison of Clinical Characteristics

Characteristic		cN2b (n=21)	cN3b (n=104)	p-value
Age (median)		47.1 (28-71)	46.7 (26-71)	0.12
Tumor size				
	T1	3 (14%)	6 (6%)	**0.039**
	T2	17 (81%)	68 (65%)	
	T3	1 (5%)	30 (29%)	
Medially located breast cancer		11 (52%)	31 (30%)	**0.046**
Breast surgical procedure				
Mastectomy		15	94	**0.029**
Breast-Conserving Surgery		6	10	
Histological type				
- Invasive ductal		20 (95%)	90 (87%)	0.26
- Others		1 (5%)	14 (13%)	
Hormone Receptor				
-positive		13 (62%)	62 (60%)	0.85
-negative		8 (38%)	42 (42%)	
HER2				
-positive		4 (19%)	27 (26%)	0.50
-negative		17 (81%)	77 (74%)	
Postoperative radiotherapy		20 (95%)	101 (97%)	0.66

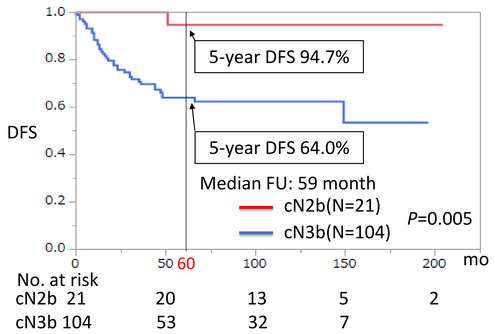


Fig. 2 Disease-Free Survival (DFS): cN2b vs. cN3b

Table2. Patient Characteristics of cN2b Cases by Type of Axillary Surgery*

Characteristic		SLNB (n=10)	ALND (n=10)	p-value
Age (median)		50.7 (30-71)	43.7 (28-61)	0.17
Tumor size				
	T1	2	1	0.51
	T2	8	8	
	T3	0	1	
Medially located breast cancer		6	4	0.37
IMLN excision		1	1	
AXLN metastasis				
-positive		0**	2	0.85
-negative		10**	8	
Postoperative radiotherapy		10	10	0.66

*One case did not undergo AXLN and IMLN surgery due to the patient's preference
**According to SLNB pathology results

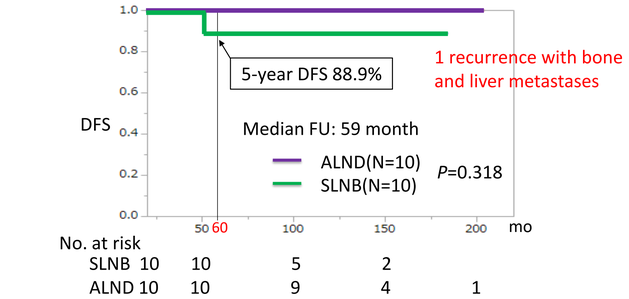


Fig. 3 Disease-Free Survival (DFS): SLNB vs. ALND in cN2b

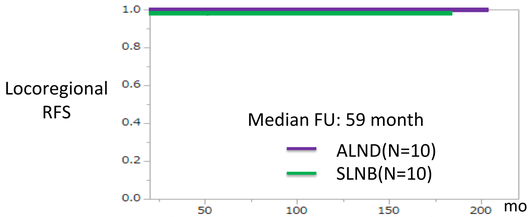


Fig. 4 Locoregional recurrence-free survival(RFS): SLNB vs. ALND in cN2b

- No cases in the cN2b group required conversion from SLNB to ALND
- IMLN metastases were observed in 0.8% of all surgical cases, with isolated IMLN metastasis (cN2b) in 0.1% (limited to cytologically confirmed cases) (Fig. 1)
- Medially located breast cancer was more frequent in cN2b than cN3b cases (52% vs. 30%) (Table 1)
- Patients with cN2b had significantly better 5-year DFS than those with cN3b (94.7% vs. 64.0%, p = 0.005) (Fig. 2)
- Among cN2b cases, SLNB alone achieved adequate local control with no locoregional recurrence (Fig. 3,4)

Limitation

- Small sample size may limit statistical power
- Retrospective design introduces potential bias
- Only cytologically or histologically confirmed cases were included, possibly limiting generalizability

Conclusion

Patients with isolated internal mammary lymph node metastasis (cN2b) had significantly better prognosis compared to those with additional axillary lymph node involvement. No difference in outcomes was observed between different axillary surgical procedures, suggesting that axillary lymph node dissection may be safely omitted. Further studies with larger cohorts are warranted.

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References
1. Kaela Braue, et al. ANZ J Surg. 2023;93(1-2):59-64.