The Necessity of Sentinel Lymph Node Biopsy for Ductal Carcinoma in Situ Patients: a Retrospective Analysis of a Single Institute in Taiwan

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Introduction

Ductal carcinoma in situ (DCIS) represents the preinvasive stage of breast cancer, characterized by malignant epithelial proliferation confined within the mammary ducts without stromal invasion. Because of its non-invasive nature, axillary lymph node involvement is exceedingly rare, and current international guidelines and consensus generally do not recommend routine lymph node excision.

Nevertheless, the risk of pathologic upstaging from an initial clinical diagnosis of DCIS to invasive carcinoma after definitive surgery remains clinically significant, with reported rates exceeding 30% in some studies. While sentinel lymph node biopsy (SLNB) is typically not recommended for patients undergoing breast-conserving surgery, the procedure is occasionally performed in selected cases based on individualized clinical considerations.

This study aims to present our real-world institutional experience addressing this clinical uncertainty, with the goal of improving risk-based decision-making for SLNB indications in patients with an initial diagnosis of DCIS.

Methods and Materials

203 patients with a clinical diagnosis of DCIS at a single tertiary center in Taiwan from 2019 to 2023 were retrospectively reviewed. All cases underwent definitive surgery (breast-conserving surgery or total mastectomy, with or without sentinel lymph node biopsy) and had final pathology available.

Collected variables included patient demographics, tumor palpability, ultrasound-measured tumor size, biopsy method, DCIS grade, and IHC markers including estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2) status were evaluated.

The study endpoints were the upstaging rate from DCIS to invasive carcinoma and the sentinel lymph node (SLN) positive rate on final pathology. Risk factors for upstaging were analyzed using univariate and multivariate logistic regression.

Table 1. Demographics and clinical characteristics of patients with clinically diagnosed DCIS

	N=203
Mean age, year ±SD	52.73 ±11.22
Age (%)	
<50	91 (44.8)
≥50	112 (55.2)
Side (%)	
Left	104 (51.2)
Right	99 (48.8)
Tumor palpability (%)	
Palpable	106 (52.2)
Nonpalpable	97 (47.8)
BMI (%)	
<18.5 (underweight)	12 (5.9)
18.5~24.9 (normal)	126 (62.1)
25~29.9 (overweight)	56 (27.6)
≥30 (obese)	9 (4.4)
Parity (%)	
Nulliparous	43 (21.2)
Parous	160 (78.8)
Sonographic tumor size (%)	
<2.0cm	123 (60.6)
≥2.0cm	71 (35.0)
Sonography BI-RADS (%)	
3	18 (8.9)
4a	105 (51.7)
4b	28 (13.8)
4c	35 (17.2)
5	8 (3.9)
Biopsy method (%)	
CNB	140 (69.0)
VABB	32 (15.8)
EB	31 (15.3)
Biopsy tissue grading (%)	
Low	44 (21.7)
Intermediate	94 (46.3)
High	65 (32.0)
ER (%)	
Positive	155 (76.4)
Negative	48 (23.6)
PR (%)	
Positive	127 (62.6)
Negative	74 (36.5)
HER2 (%)	
3+	56 (27.6)
2+	23 (11.3)
1+, 0	113 (55.7)
Surgery (%)	
PM only	26 (12.8)
PM + SLNB	87 (42.9)
TM only	6 (3.0)
TM + SLNB	84 (41.4)
SLNB (%)	
Performed	171 (84.2)
SLN positive	4 (2.3)
Final diagnosis (%)	
DCIS	148 (72.9)
Invasive breast cancer	55 (27.1)

Table 3. Multivariate regression identified independent predictors of DCIS upstaging

	OR (95% CI)	P-value
Age ≥50	2.34 (1.07-5.13)	0.034
Palpable tumor	2.23 (1.02-4.86)	0.044
Sonographic tumor size ≥2.0cm	1.85 (0.79-4.37)	0.159
Sonography BI-RADS ≥4b	0.83 (0.36-1.92)	0.664
Received CNB	12.65 (3.13-51.10)	<0.001
High nuclear grade	3.41 (1.37-8.51)	0.008

Table 2. Comparison of clinicopathologic features between final diagnosis

	DCIS	Invasive breast cancer	P-value
Mean age, year ±SD	51.87 ±10.39	55.04 ±13.03	0.074
Age (%)			0.035
<50	73 (80.2)	18 (19.8)	
≥50	75 (67.0)	37 (33.0)	
Tumor palpability (%)			0.009
Palpable	69 (65.1)	37 (34.9)	
Nonpalpable	79 (81.4)	18 (18.6)	
BMI (%)			0.483
<18.5 (underweight)	11 (91.7)	1 (8.3)	
18.5~24.9 (normal)	90 (71.4)	36 (28.6)	
25~29.9 (overweight)	41 (73.2)	15 (26.8)	
≥30 (obese)	6 (66.7)	3 (33.3)	
Parity (%)			0.524
Nulliparous	33 (76.7)	10 (23.3)	
Parous	115 (71.9)	45 (28.1)	
Sonographic tumor size (%)			0.016
<2.0cm	96 (78.0)	27 (22.0)	
≥2.0cm	44 (62.0)	27 (38.0)	
Sonography BI-RADS (%)			0.045
≤4a	102 (77.9)	29 (22.1)	
≥4b	46 (64.8)	25 (35.2)	
Biopsy method (%)			<0.001
CNB	90 (64.3)	50 (35.7)	
VABB, EB	58 (92.1)	5 (7.9)	
Biopsy tissue grading (%)			0.068
Low, intermediate	106 (76.8)	32 (23.2)	
High	42 (64.6)	23 (35.4)	
ER (%)			0.999
Positive	113 (72.9)	42 (27.1)	
Negative	35 (72.9)	13 (27.1)	
PR (%)			0.484
Positive	95 (74.8)	32 (25.2)	
Negative	52 (70.3)	22 (29.7)	
HER2 (%)			0.404
3+	41 (73.2)	15 (26.8)	
2+	19 (82.6)	4 (17.4)	
1+, 0	78 (69.0)	35 (31.0)	

IHC, immunohistochemistry; SD, standard deviation; BMI, body mass index; BI-RADS, Breast Imaging Reporting and Data System; PM, partial mastectomy; TM, total mastectomy; OR, odds ratio; CI, confidence interval

Results

Among the 203 patients with a clinical diagnosis of DCIS, 55 (27.1%) were upstaged to invasive carcinoma on final surgical pathology. SLNB was performed concurrently in 171 patients (84.2%), and nodal metastasis was identified in 4 cases (2.3%) (Table 1).

In the evaluation of clinicopathologic variables, univariate analysis demonstrated that over 50 years of age, presence of a palpable tumor, diagnosis established by core needle biopsy (CNB) rather than vacuum-assisted breast biopsy (VABB) or excisional biopsy (EB), sonographic tumor size ≥2 cm, and BI-RADS category ≥4b on ultrasound were significantly associated with DCIS upstaging to invasive disease (Table 2).

On multivariate logistic regression analysis, age ≥50 years, palpable tumor, and diagnosis via CNB remained independent predictors of upstaging, while high nuclear grade DCIS emerged as an additional significant factor after adjustment for other covariates (Table 3).

Conclusions

In this single-institution real-world analysis of Asian patients with a clinical diagnosis of DCIS, more than one-quarter were upstaged to invasive carcinoma on final pathology, and although SLN metastasis was infrequent, it was not negligible.

Several readily identifiable clinical and pathological factors—particularly age ≥50 years, palpable tumor, CNB as the diagnostic method, larger sonographic tumor size, and high nuclear grade—were significantly associated with upstaging risk.

These findings support a precisely elective, risk-adapted approach to the adoption of SLNB, especially for patients presented with multiple high-risk features.

A structured preoperative risk assessment, integrated with shared decision-making, may reduce the incidence of secondary operations, mitigate patient anxiety, and facilitate appropriate nodal staging in carefully selected individuals.

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