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Extent of Microinvasion in Ductal Carcinoma In Situ Is Not Associated with Sentinel Lymph Node Metastases

Cindy B. Matsen, MD¹, Allison Hirsch, BA¹, Anne Eaton, MS², Michelle Stempel, MPH¹, Alexandra Heerdt, MD¹, Kimberly J. Van Zee, MD¹, Hiram S. Cody III, MD¹, Monica Morrow, MD¹, and George Plitas, MD¹

¹Breast Service, Department of Surgery, Memorial Sloan Kettering Cancer Center, New York, NY

²Department of Epidemiology and Biostatistics, Memorial Sloan Kettering Cancer Center, New York, NY

Abstract

Background—DCIS with microinvasion (DCISM) is a rare diagnosis with a good prognosis. Although nodal metastases are uncommon, sentinel lymph node biopsy (SLNB) remains standard care. Volume of disease in invasive breast cancer is associated with SLNB positivity and, thus, we hypothesized that in a large cohort of patients with DCISM, multiple foci of microinvasion might be associated with a higher risk of positive SLNB.

Methods—Records from a prospective institutional database were reviewed to identify patients with DCISM who underwent SLNB between June 1997 and December 2010. Pathology reports were reviewed for number of microinvasive foci and categorized as one focus or ≥ 2 foci. Demographic, pathologic, treatment, and outcome data were obtained and analyzed.

Results—Of 414 patients, 235 (57%) had one focus of microinvasion and 179 (43%) had ≥ 2 foci. SLNB macrometastases were found in 1.4% and micrometastases were found in 6.3%; neither were significantly different between patients with one focus vs ≥ 2 foci ($p=1.0$). Patients with positive SLNB or ≥ 2 foci of microinvasion were more likely to receive chemotherapy. At median 4.9 years (range 0-16.2) follow-up, 18 patients, all in the SLNB negative group, had recurred for an overall 5-year recurrence-free proportion of 95.9%.

Conclusions—Even with large numbers, there was no higher risk of nodal involvement with ≥ 2 foci of microinvasion as compared to 1 focus. Number of microinvasive foci and results of SLNB appear to be used in decision making for systemic therapy. Prognosis is excellent.

Keywords

Microinvasion; lymph node metastases; local therapy

Corresponding author: George Plitas, MD Breast Service, Department of Surgery Memorial Sloan Kettering Cancer Center 300 E. 66th St. New York, NY 10065 (T) 646 888 5368 (F) 646 888 4917 (E) plitasg@mskcc.org.

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INTRODUCTION

Ductal carcinoma in situ with microinvasion (DCISM) is a pathologic diagnosis defined by the presence of ≥ 1 mm of invasive cancer in a background of DCIS and comprises 0.6-3.4% of breast cancer diagnoses.¹⁻³ In the American Joint Committee on Cancer (AJCC) staging system, it is considered a subset of T1 disease (T1mi).⁴ These patients are generally considered to have a better prognosis than “macroinvasive” cancers, but worse than DCIS alone.^{5,6} The rarity of DCISM has made study of risk factors, management, and outcomes difficult.^{2,6,7} The risk of axillary lymph node metastases is low^{3,8-15}, but no studies have been able to consistently identify any pathologic or demographic factor predictive of nodal disease.^{8,10,16-18} We have previously reported that 2.7% of 112 patients with DCISM had axillary lymph node macrometastases and 10% micrometastases.⁸ Currently, evaluation of the axilla with sentinel lymph node biopsy (SLNB) remains standard care for any patient with DCISM. Identification of patients at higher risk for lymph node metastases would allow for selective use of SLNB and decrease unnecessary axillary surgery in low-risk patients. Small, single-institution studies have suggested that the extent of microinvasion on histologic examination may be predictive of an increased risk for sentinel lymph node metastases.¹⁷ The current AJCC staging system⁴ does not differentiate DCIS with multiple foci of microinvasion from DCIS with a single focus of microinvasion; both are T1mi. Since the volume of invasive cancer is predictive of SLNB positivity¹⁹, we hypothesized that in a large cohort of patients with DCISM, a significant association of multiple sites of microinvasive disease with positive SLNB might exist. In this study, we report the incidence of lymph node involvement in DCISM patients with a single versus multiple sites of microinvasion.

MATERIALS AND METHODS

With institutional review board approval, we retrospectively examined records from a prospectively collected database maintained by our institution. We identified patients with DCISM who underwent SLNB at Memorial Sloan Kettering Cancer Center between June 1997 and December 2010. Data on age, type of surgery and type of axillary procedure, and any adjuvant radiation-, hormonal- or chemo-therapy were collected. Patients with contralateral breast cancer and those with missing adjuvant systemic treatment records were excluded from the analysis of systemic treatment between groups. Pathologic variables collected included histologic tumor type, histologic and nuclear grade, presence of lymphovascular invasion (LVI), and receptor status (estrogen receptor [ER], progesterone receptor [PR], and HER2). Biopsy and final pathology results were reviewed for statements regarding number of invasive foci and categorized as having one focus or ≥ 2 foci of microinvasive cancer. This cutoff was selected as a consequence of the language used in the pathology reports. One or two foci were mentioned specifically, but beyond that, descriptors such as “a few”; “scattered”; “some”; or, more rarely, “many” or “extensive” were used, precluding numerical quantification. These patients were recorded as having >2 foci. We excluded patients with an unknown number of foci ($n=12$). A positive SLNB was defined as the presence of micrometastasis (>200 cells or >0.2 mm, but not >2.0 mm) or macrometastasis (>2.0 mm) identified on hematoxylin and eosin (H&E) staining. Our institution did perform immunohistochemistry (IHC) on sentinel lymph nodes during the

study timeframe. Patients with SLNB metastases detected only on IHC were not considered to have a positive SLNB and were excluded from the positive SLNB group.

Date of last follow-up and status at last follow-up were collected for all patients. Recurrence events were recorded as local (ipsilateral breast or chest wall), regional (ipsilateral axillary or supraclavicular lymph nodes), distant, or concurrent local and distant.

Statistical Analysis

Patient characteristics were summarized using number and percent for categorical variables, and median and range for continuous variables. Characteristics were compared between patients with a single focus of microinvasion and patients with ≥ 2 foci of microinvasion and between patients who received and did not receive chemo using the chi-square test for categorical covariates (Fisher's exact test in the case of small numbers within a cell) and the Wilcoxon rank-sum test for continuous covariates. Univariate logistic regression was used to test associations between demographic and pathological characteristics, and a positive SLNB. Time-to-event outcomes (overall survival and proportion recurrence-free) were estimated using Kaplan-Meier methods. Time to death and time to recurrence were measured from date of SLNB and censored at the date of last follow-up for event free patients. Time to recurrence was censored at time of death. Overall survival and proportion recurrence-free were compared across groups using the log-rank test.

All statistical analysis was done in SAS 9.2 (SAS Institute, Cary, NC), and p-values less than 0.05 were considered significant.

RESULTS

A total of 426 patients with DCISM were identified; 12 patients with an unknown number of microinvasive foci were excluded, leaving 414 patients for analysis. Median age was 54 years (range 27-84). 235 (57%) had only one focus of microinvasion, and 179 (43%) had ≥ 2 foci. Both groups had a median of 2 sentinel lymph nodes removed (ranges, 0-14 and 1-11, respectively).

SLNB metastases were identified in 7.7% (32) of patients; 1.4% (6) had macrometastasis and 6.3% (26) had micrometastasis. Of patients with one focus of microinvasion, 18 (7.7%) had a positive sentinel lymph node. 14 (7.8%), of patients with ≥ 2 foci of microinvasion had nodal metastases ($p=0.95$) (Table 1). There were 3 patients in each group with SLNB macrometastasis, a 1.3% incidence in patients with a single focus of microinvasion, and 1.7% for those with ≥ 2 foci ($p=1.0$). The remainder had micrometastatic disease. None of the patients with positive SLNB in the ≥ 2 foci group were described as having "extensive" or "many" foci in the pathology reports.

Patients with multiple foci of microinvasion were more likely to have poor prognostic features of the primary tumor, including a significantly higher incidence of poorly differentiated tumors and tumors negative for estrogen and progesterone receptors, and positive for HER2 receptor, though in many cases, the invasive carcinoma was too small to

assess these factors (Table 2). The incidence of LVI was low in both groups: 2 patients in the one-focus group, and 7 patients in the multiple-foci group.

The groups received similar local therapy, with 114 (49%) in the one-focus group and 84 (47%) in the multiple-foci group undergoing breast conservation ($p=0.75$), and 98 (42%) and 76 (43%), respectively ($p=0.86$), receiving radiation therapy.

There were differences with regard to receipt of adjuvant systemic therapy. Similar numbers of patients in both groups received hormonal therapy—87 (38%) in the one-focus group, and 70 (41%) in the multiple-foci group ($p=0.56$)—but chemotherapy was used significantly more frequently in the multiple-foci group than the one-focus group (11% versus 5%; $p=0.04$).

On univariate analysis (Table 3), 2 foci of microinvasive disease was not associated with the presence of positive SLNs ($p=0.95$). The presence of LVI was the only pathologic factor associated with a positive SLNB (odds ratio [OR], 10.83; 95% confidence interval [CI], 2.74-42.79; $p<0.01$). Of the 32 patients with positive SLNs, 15 (47%) went on to completion axillary lymph node dissection (CALND). Only 2 (13%) of these patients were found to have additional positive axillary nodes. One of these patients had one focus DCISM and one had multiple foci of microinvasion, and both patients had SLNB macrometastases.

The use of chemotherapy was more common among SLNB positive patients: only 12 (3%) of SLNB-negative patients received chemotherapy compared with 19 (63%) in the SLNB-positive group ($p<0.01$). Similarly, hormone therapy was given to 136 (37%) of SLNB-negative patients compared to 21 (70%) of SLNB-positive patients ($p<0.01$).

In the subset of patients with a negative SLNB, multiple foci of microinvasion was significantly associated with receipt of chemotherapy when compared to patients with one focus of microinvasion: 11 (6.8%) versus 1 (0.5%), respectively ($p<0.01$), suggesting that this pathologic factor may be used in decision making for chemotherapy. The same was not true of patients with one focus versus multiple foci of microinvasion receiving hormonal therapy with 74 (35%) versus 62 (39%), respectively ($p=0.40$). We were unable to identify other pathologic factors correlating with the receipt of chemotherapy, but this analysis was limited by missing data and the small number of patients treated.

The median follow-up was 4.9 years (range, 0-16.2) for the total population and was similar for SLNB positive, SLNB negative, one-focus, or multiple-foci patients. Overall survival at 5 years was 98.3% (95% CI, 95.8-99.3) for the total population and was not significantly different when comparing SLNB-positive (100%) and SLNB-negative patients (98.1%) ($p=0.26$), or patients with one focus (98.2%) versus multiple foci of (98.3%) microinvasion ($p=0.58$).

There were 18 (4.3%) recurrences among the 414 patients: 14 local; 1 regional; 2 distant; and 1 concurrent local and distant. Overall recurrence-free proportion at 5 years was 95.9% (95% CI, 93.2-97.6) (Figure 1a). Although all of the recurrences were in the SLNB-negative group, SLNB status was not significantly associated with remaining recurrence free ($p=0.22$) (Figure 1b). Recurrence-free proportion was also similar in the one-focus and multiple-foci

groups ($p=0.81$) (Figure 1c). No patients who recurred in the 2 foci group were described as having “extensive” or “many” foci on their primary pathology reports. All three patients with distant disease recurrence had a single focus of microinvasion initially, and 1 had received chemotherapy at diagnosis.

DISCUSSION

DCIS with microinvasion presents a therapeutic conundrum. The prognosis falls somewhere between invasive cancer and DCIS, but where individual patients fall on the prognostic spectrum is unclear, and risk stratification based on retrospective reports has been difficult due to the overall rarity of this entity. Furthermore, insight into the biologic behavior of the invasive component is limited due to the small invasive volume in these specimens which precludes tumor evaluation on a molecular level by standard genomic assays (e.g., OncotypeDX, MammaPrint) and sometimes does not allow determination of ER and HER2 status, leaving clinicians with descriptors in the pathology report to guide decisions regarding locoregional and systemic treatment. In this study, SLNB status was strongly correlated with the use of adjuvant systemic therapy. Multifocality and volume of invasive disease in both the breast and the axillary nodes has been correlated with increased lymph node burden in patients with invasive breast cancer^{20,21}, and a recently published small study¹⁷ looking at this in DCISM showed a trend toward association of multiple sites of microinvasion with SLNB metastases, but this failed to reach statistical significance. Even with our larger numbers, we were unable to demonstrate any correlation between multiple sites of microinvasion and SLNB metastases, though our definition of multiple sites is likely not a perfect surrogate for volume of the microinvasive component. We could not identify any factor other than LVI (which has long been known to confer greater risk for nodal metastases) that could identify a subset of patients at higher risk of lymph node metastases. Consequently, we also could not identify a low-risk group of patients that could be spared SLNB. The overall risk of clinically meaningful SLNB metastases is very low (1.4%) and essentially equal to the historic rate of nodal positivity in DCIS.^{22,23} With this in mind, it could be argued that SLNB could be omitted (as it is in DCIS) in patients with DCISM undergoing breast-conserving surgery.

Patients with DCISM and a positive SLNB are unlikely to benefit from CALND, though the numbers in our study are not large enough to draw definitive conclusions. However, the demonstration in American College of Surgeons Oncology Group (ACOSOG) trial Z011 that patients with axillary macrometastases in 1 or 2 SLNs can be managed without axillary dissection, coupled with a similar finding for patients with micrometastases undergoing breast-conserving surgery or mastectomy²⁴, strongly suggests that axillary dissection will not convey a survival benefit in this population and is not needed for local control.

In summary, our study demonstrates that patients with microinvasive carcinoma with both single and multiple foci of invasion have a very low risk of axillary nodal disease and a long-term survival that more closely resembles that of patients with DCIS than what is observed in patients with T1a invasive carcinoma.

Multiple foci of the microinvasive component does appear to influence decisions regarding systemic therapy. Although we found that multiple foci was associated with the use of systemic therapy, it is possible that other histologic or biologic factors played a role in the decision to give systemic therapy. In our population, the presence of 2 foci of microinvasion was associated with more poorly differentiated disease, and was more likely to be hormone receptor (HR) negative and HER2 positive, though, interestingly, none of the patients who were HR negative and had a negative SLNB received chemotherapy. It is also not clear whether presence of multiple foci has any influence on prognosis. The general assumption that increased volume of the microinvasive component in DCISM increases the risk of distant events may be unfounded and was not demonstrated in our patient population. What is clear in this and numerous other studies is that the majority of patients with DCISM do very well and that survival is very high in this group.^{2,3,7,8,17,25} It is also clear that our current methods for evaluating risk of recurrence in these patients are lacking. Though our study did not detect an association between multiple foci and recurrence, it may be underpowered to do so. Anatomy is a poor reflection of biology for some of these tumors, as evidenced by the recurrences and death from disease in the group of patients with negative SLN and a single focus of microinvasion on original pathology. Recurrence rates are consistently higher in the SLN-negative DCISM populations in multiple studies.^{3,17} The distant recurrence rate (all in SLN-negative patients) in our study was 0.8%, which is the historic rate of distant recurrence for DCIS. This argues that the prognosis of DCISM is closer to that of DCIS rather than invasive cancer, though this is obviously not true for all patients. Also consistent in these studies is the lower rate of systemic therapy used in the SLN-negative DCISM population. This is likely directly related to the excellent prognosis in the SLN-positive group, though which patients derive the most benefit from systemic therapy in this group is unclear. While the overall benefit of using systemic therapy in this low-risk patient population would be exceedingly small, the limited existing data suggest that there are individuals who may benefit. This confirms the need to identify other factors to assist in the risk-benefit analysis for adjuvant therapies in individual patients with DCISM.

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REFERENCES

1. Bianchi S, Vezzosi V. Microinvasive carcinoma of the breast. *Pathol Oncol Res.* 2008; 14(2):105–11. [PubMed: 18493870]
2. Shatat L, Gloyeske N, Madan R, et al. Microinvasive breast carcinoma carries an excellent prognosis regardless of the tumor characteristics. *Hum Pathol.* 2013; 44(12):2684–9. [PubMed: 24071019]
3. Pimiento JM, Lee MC, Esposito NN, et al. Role of axillary staging in women diagnosed with ductal carcinoma in situ with microinvasion. *J Oncol Pract.* 2011; 7(5):309–13. [PubMed: 22211128]
4. Edge, S.; Byrd, DR.; Compton, CC., et al. *AJCC Cancer Staging Manual.* 7th Edition.. Springer; New York: 2009.

5. Wong JH, Kopald KH, Morton DL. The impact of microinvasion on axillary node metastases and survival in patients with intraductal breast cancer. *Arch Surg.* 1990; 125(10):1298–301. discussion 301-2. [PubMed: 2171453]
6. Vieira CC, Mercado CL, Cangiarella JF, et al. Microinvasive ductal carcinoma in situ: clinical presentation, imaging features, pathologic findings, and outcome. *Eur J Radiol.* 2010; 73(1):102–7. [PubMed: 19026501]
7. Sue GR, Lannin DR, Killelea B, et al. Predictors of microinvasion and its prognostic role in ductal carcinoma in situ. *Am J Surg.* 2013; 206(4):478–81. [PubMed: 23791403]
8. Lyons JM 3rd, Stempel M, Van Zee KJ, et al. Axillary node staging for microinvasive breast cancer: is it justified? *Ann Surg Oncol.* 2012; 19(11):3416–21. [PubMed: 22576061]
9. Gray RJ, Mulheron B, Pockaj BA, et al. The optimal management of the axillae of patients with microinvasive breast cancer in the sentinel lymph node era. *Am J Surg.* 2007; 194(6):845–8. discussion 8-9. [PubMed: 18005782]
10. Guth AA, Mercado C, Roses DF, et al. Microinvasive breast cancer and the role of sentinel node biopsy: an institutional experience and review of the literature. *Breast J.* 2008; 14(4):335–9. [PubMed: 18537917]
11. Intra M, Zurrida S, Maffini F, et al. Sentinel lymph node metastasis in microinvasive breast cancer. *Ann Surg Oncol.* 2003; 10(10):1160–5. [PubMed: 14654471]
12. Katz A, Gage I, Evans S, et al. Sentinel lymph node positivity of patients with ductal carcinoma in situ or microinvasive breast cancer. *Am J Surg.* 2006; 191(6):761–6. [PubMed: 16720145]
13. Klauber-DeMore N, Tan LK, Liberman L, et al. Sentinel lymph node biopsy: is it indicated in patients with high-risk ductal carcinoma-in-situ and ductal carcinoma-in-situ with microinvasion? *Ann Surg Oncol.* 2000; 7(9):636–42. [PubMed: 11034239]
14. Zavagno G, Belardinelli V, Marconato R, et al. Sentinel lymph node metastasis from mammary ductal carcinoma in situ with microinvasion. *Breast.* 2007; 16(2):146–51. [PubMed: 17046258]
15. Parikh RR, Haffty BG, Lannin D, et al. Ductal carcinoma in situ with microinvasion: prognostic implications, long-term outcomes, and role of axillary evaluation. *Int J Radiat Oncol Biol Phys.* 2012; 82(1):7–13. [PubMed: 20950955]
16. van la Parra RF, Ernst MF, Barneveld PC, et al. The value of sentinel lymph node biopsy in ductal carcinoma in situ (DCIS) and DCIS with microinvasion of the breast. *Eur J Surg Oncol.* 2008; 34(6):631–5. [PubMed: 17851019]
17. Kapoor NS, Shamonki J, Sim MS, et al. Impact of multifocality and lymph node metastasis on the prognosis and management of microinvasive breast cancer. *Ann Surg Oncol.* 2013; 20(8):2576–81. [PubMed: 23468047]
18. Lee SK, Cho EY, Kim WW, et al. The prediction of lymph node metastasis in ductal carcinoma in situ with microinvasion by assessing lymphangiogenesis. *J Surg Oncol.* 2010; 102(3):225–9. [PubMed: 20740579]
19. Bevilacqua JL, Kattan MW, Fey JV, et al. Doctor, what are my chances of having a positive sentinel node? A validated nomogram for risk estimation. *J Clin Oncol.* 2007; 25(24):3670–9. [PubMed: 17664461]
20. Andea AA, Bouwman D, Wallis T, et al. Correlation of tumor volume and surface area with lymph node status in patients with multifocal/multicentric breast carcinoma. *Cancer.* 2004; 100(1):20–7. [PubMed: 14692020]
21. Coombs NJ, Boyages J. Multifocal and multicentric breast cancer: does each focus matter? *J Clin Oncol.* 2005; 23(30):7497–502. [PubMed: 16234516]
22. Fisher B, Dignam J, Wolmark N, et al. Lumpectomy and radiation therapy for the treatment of intraductal breast cancer: findings from National Surgical Adjuvant Breast and Bowel Project B-17. *J Clin Oncol.* 1998; 16(2):441–52. [PubMed: 9469327]
23. Julian TB, Land SR, Fourchotte V, et al. Is sentinel node biopsy necessary in conservatively treated DCIS? *Ann Surg Oncol.* 2007; 14(8):2202–8. [PubMed: 17534687]
24. Galimberti V, Cole BF, Zurrida S, et al. Axillary dissection versus no axillary dissection in patients with sentinel-node micrometastases (IBCSG 23-01): a phase 3 randomised controlled trial. *Lancet Oncol.* 2013; 14(4):297–305. [PubMed: 23491275]

25. van der Heiden-van der Loo M, Schaapveld M, Ho VK, et al. Outcomes of a population-based series of early breast cancer patients with micrometastases and isolated tumour cells in axillary lymph nodes. *Ann Oncol.* 2013; 24(11):2794–801. [PubMed: 23864096]

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Synopsis

DCIS with microinvasion is a rare diagnosis with an excellent prognosis and a low rate of nodal involvement. This study attempts to identify factors associated with a positive sentinel lymph node biopsy and provides outcome data on these patients.

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FIG. 1.

(a) Recurrence-free proportions for total population. (b) SLNB-positive and SLNB-negative groups with p-value for comparison at 5 years after SLNB. (c) One focus of microinvasion and 2 foci groups (p=0.81) for comparison at 5 years after SLNB. SLNB, sentinel lymph node biopsy

TABLE 1

Number of microinvasive foci and rate of positive SLNB on H&E with p-values for comparison of rates between groups

No. of microinvasive foci	No. of patients	SLN positive	Macrometastasis	Micrometastasis
1	235	18 (7.7%)	3 (1.3%)	15 (6.4%)
>1	179	14 (7.8%) p = 0.95	3 (1.7%) p = 1.0	11 (6.1%)
Total	414	32 (7.7%)	6 (1.4%)	26 (6.3%)

SLNB, sentinel lymph node biopsy; H&E, hematoxylin and eosin; SLN, sentinel lymph node;

TABLE 2

Comparison of patients by number of microinvasive foci (N=414 unless otherwise noted). Percentages use the N noted in the variable column as the denominator. Receptor status was assessed on the invasive component of the disease.

Variable		1 focus of microinvasion (N=235)	2 foci of microinvasion (N=179)	p-value
Age (median)		53 (27-84)	54 (32-83)	0.48
Surgery	BCT	114 (49%)	84 (47%)	0.75
	Mastectomy	121 (51%)	95 (53%)	
Axillary Procedure	SLNB only	222 (94%)	169 (94%)	0.98
	SLNB converted to ALND	13 (6%)	10 (6%)	
No. of SLNs Removed (median)		2 (0-14)	2 (1-11)	0.25
Histologic Grade (N=56)	Well differentiated	11 (34%)	3 (13%)	0.01
	Moderately differentiated	14 (44%)	6 (25%)	
	Poorly differentiated	7 (7%)	15 (63%)	
LVI (N=387)	Absent	213 (99%)	165 (96%)	0.08
	Present	2 (1%)	7 (4%)	
ER (N=286)	Positive	109 (70%)	72 (55%)	0.01
PR (N=279)	Positive	78 (52%)	48 (37%)	0.02
HER2 (N=217)	Positive	28 (27%)	56 (49%)	<0.01
Radiation Therapy (N=410)		98 (42%)	76 (43%)	0.86
Chemotherapy* (N=406)		12 (5%)	19 (11%)	0.04
Hormonal Therapy* (N=402)		87 (38%)	70 (41%)	0.56

* Patients with contralateral disease excluded

TABLE 3

Factors associated with positive SLNB in DCISM on univariate analysis

Variable		Odds Ratio (95% CI)	p-value
Foci of microinvasion (N=414)	1	Ref	0.95
	2	1.02 (0.49-2.12)	
Age (N=414)	Per one year increase	0.97 (0.95-1.01)	0.17
Histologic Grade (N=56)	Well	Ref	0.78
	Moderate	2.29 (0.21-24.68)	
	Poor	2.05 (0.19-21.97)	
LVI (N=387)	Absent	Ref	<0.01
	Present	10.83 (2.74-42.79)	
ER (N=286)	Positive	Ref	0.48
	Negative	1.33 (0.60-2.93)	
PR (N=279)	Positive	Ref	0.89
	Negative	0.95 (0.43-2.07)	
HER2 (N=217) *	Negative	Ref	0.10
	Positive	0.44 (0.17-1.17)	

* Patients with equivocal result excluded