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Sentinel lymph node biopsy in low risk settings

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ABSTRACT

Background: Sentinel lymph node biopsy (SLNB) should be performed in patients with ductal carcinoma in situ (DCIS) undergoing mastectomy. Yet, the same logic is controversial in the setting of prophylactic mastectomy.
Methods: Surgeons were surveyed as to their practices. Statistical analyses were performed to identify associated factors.
Results: 238 surgeons responded to the survey. 73.1% of respondents stated they would *always* perform SLNB in the setting of mastectomy for DCIS, but only 6.6% would *always* do so in the prophylactic setting. While generally perceived that the rate of SLN positivity in the setting of pure DCIS and prophylactic mastectomy was <5% (96.9% and 99.5%, respectively), 61.8% of surgeons who reported "always" performing SLNB in the setting of DCIS treated with mastectomy stated they "never" performed a SLNB for prophylactic mastectomy.
Conclusion: SLNB practice patterns for these low risk settings are disparate. Consensus is required to rationalize practice.

1. Introduction

While sentinel lymph node biopsy (SLNB) has been well-established in the management of invasive breast cancer, its use in the settings of ductal carcinoma in situ (DCIS) and prophylactic mastectomy remains controversial.[1–5] Given that DCIS is by definition non-invasive, the risk of having positive lymph nodes (LNs) in this setting should be nil. There is, however, a risk of sampling error such that some of these patients may have occult invasive disease found on final pathology which would then warrant LN evaluation. Published data suggest that the rate of axillary metastases in DCIS ranges between 1% and 13%[6–8] and is commonly quoted to be approximately 2%.[9,10]

Published guidelines advise the use of SLNB in the setting of mastectomy for DCIS,[11–13] as it is generally felt that one cannot go back to perform a SLNB after mastectomy if invasive disease is later found even though some studies have suggested SLNB might still be feasible after mastectomy.[14,15] SLNB in the setting of prophylactic mastectomy, however, is more controversial. Some patients undergoing prophylactic mastectomy will have occult invasive cancer found on final pathology. In these patients, LN evaluation would be required and SLNB cannot be performed after mastectomy. A recent meta-analysis showed that the incidence of positive nodes in this setting was 1.9%.[16] Hence, one could argue that the rationale for performing SLNB in these patients should be the same as for DCIS treated with mastectomy. Yet, many surgeons approach these settings differently. We sought to determine current practice patterns with regards to LN evaluation in each of these low risk settings, and the factors that may underpin the differences in approach in each.

2. Material and methods

An anonymous web-based survey of surgeons designed to evaluate surgeons' use of SLNB in a variety of settings was posted on the American College of Surgeons (ACoS) Communities online platform. This is a series of discussion boards, including "general

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surgery", and "breast surgery". The current membership of the "breast surgery" community is ~4500 surgeons, of which 3881 are oncologic or general surgeons (634 are plastic surgeons). Given that participation in these discussion boards is voluntary, and on any given day, there may be more or fewer surgeons who access these websites, it is difficult to calculate a definitive "response rate"; however, we obtained age and geographic distributions of the membership of the breast surgery community, and compared this to the distribution of respondents to assess, as far as possible, for selection bias. The survey was posted on June 28, 2015; 238 surgeons responded within the first week of posting. Beyond respondents' demographic and practice related data, surgeons were asked *"How often do you perform SLNB in patients presenting with pure DCIS (i.e., no microinvasion who are undergoing (a) partial mastectomy/lumpectomy, and (b) mastectomy"*, with possible answers for each being *"always", "sometimes"* or *"never"*. We further asked *"If you do a SLNB "sometimes" in patients with pure DCIS, which factors influence your decision of whether or not to perform a SLNB?"*. Similarly, surgeons were asked how often they would perform SLNB in the setting of prophylactic mastectomy, with the same possible answers – *"always", "sometimes"* or *"never"*. In order to ascertain surgeons' perception of the risk of LN positivity in the setting of DCIS and prophylactic mastectomy we asked the following questions: *"What rate do you quote your patients regarding the probability of SLN positivity in the setting of pure DCIS found on core needle biopsy?"* and *"What rate do you quote your otherwise healthy patients regarding the probability of SLN positivity in the setting of prophylactic mastectomy?"*.

We hypothesized that surgeons were more likely to perform SLNB in the setting of mastectomy for DCIS than in the setting of prophylactic purposes, despite the fact that both scenarios carry a low probability of LN metastases and, in both settings, the decision not to do SLNB is generally thought to be irrevocable. While there are two studies that have demonstrated that SLNB could be performed after mastectomy,[14,15] these reports are of a limited number of patients (17 in total), and therefore, performance of SLNB after mastectomy is generally not practiced. Bivariate comparisons were performed using Fishers' exact and likelihood ratio tests. Using factors found significant ($p < 0.05$) on bivariate analysis, we performed a multivariate logistic regression to determine factors associated with *"always"* performing SLNB in the settings of (a) DCIS treated with mastectomy and (b) prophylactic mastectomy. All statistical analyses were performed using IBM SPSS Statistics Version 21.0 (IBM Corp. Armonk, NY). This study was deemed exempt by the Human Investigations Committee of Yale University. Consent was implied, with language being incorporated into the survey introduction that their responses were anonymous and voluntary, and that the data would be used in aggregate.

3. Results

While we could not determine "response rate" to this survey, as it was posted on an online platform such that we could not quantify how many surgeons saw the post, 238 surgeons responded within one week. Their characteristics are shown in Table 1. The distribution of respondents' demographics seems representative of US surgeons treating breast disease. While demographics in terms of practice type and years in practice are not known for the entire membership of the "breast surgery" community on the ACoS platform, we compared surgeon age and geographic location for the membership of this community to our respondent sample. The distribution of surgeon age in the two cohorts were highly correlated (Pearson correlation coefficient = 0.738, $p < 0.001$). Respondents to our survey came from 39 States, with a geographic distribution that mirrored that of the "breast surgery" community membership (Pearson correlation coefficient = 0.875, $p < 0.001$).

Table 1
Characteristics of respondents.

Factor	Number of respondents (%)
Age (years)	
<30	1 (0.4)
30–40	46 (19.3)
41–50	74 (31.1)
51–60	64 (26.9)
61–70	37 (15.6)
>70	16 (6.7)
Years in practice	
<5	25 (10.5)
5–10	41 (17.2)
11–20	68 (28.6)
21–30	60 (25.2)
>30	44 (18.5)
Proportion of practice breast-related	
<10	25 (10.5)
10–25	56 (23.5)
26–50	31 (13)
51–75	25 (10.5)
76–99	23 (9.7)
100	78 (32.8)
Practice setting[a]	
Private practice	97 (41.1)
Hospital employed	103 (43.6)
Academic	36 (15.3)
Practice location[b]	
Rural	50 (21.1)
Suburban	109 (46)
Urban	78 (32.9)

[a] Practice setting not specified by 2 (0.8) of the respondents.
[b] Practice location not specified by 1 (0.4) of the respondents.

3.1. SLNB in patients with DCIS undergoing partial vs. total mastectomy

Surgeons were found to have different practices regarding LN evaluation in DCIS, depending on whether a partial or total mastectomy was performed. Surgeons were significantly more likely to state that they would *"always"* perform a SLNB in the setting of DCIS treated with total mastectomy than in the setting of DCIS treated with partial mastectomy (73.1% vs. 4.3%) and to report that they would *"never"* do a SLNB in patients with DCIS treated with a partial mastectomy versus a total mastectomy (36.3% vs. 5.1%), $p = 0.001$. Surgeons were more likely to use a selective approach (i.e., report *"sometimes"* doing a SLNB) in the setting of DCIS treated with partial mastectomy than with a total mastectomy (59.4% vs. 21.8%). In these circumstances, factors influencing whether to perform SLNB included: whether the lesion was palpable (70.2%), the extent of DCIS (66.5%), whether there was a solid mass on imaging (64.9%), the grade of DCIS (63.3%), whether oncoplastic reconstruction with tissue rearrangement was planned (23.9%), patient age (21.8%) and results of genetic testing (17.0%).

3.2. SLNB in patients undergoing mastectomy for DCIS vs. prophylactic mastectomy

Given that it is not possible to "go back" for SLNB after a total mastectomy, we were particularly interested in surgeons' views regarding SLNB of DCIS treated with mastectomy versus prophylactic mastectomy. Surgeons were asked how often they would perform a SLNB in each of these settings. 73.1% of respondents stated that they would *always* perform a SLNB in the setting of DCIS treated with a mastectomy and 67.1% stated that they would *never* perform a SLNB in the setting of prophylactic mastectomy.