Role of Axillary Node Dissection in Patients With T1a and T1b Breast Cancer

Mayo Clinic Experience

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Hypothesis: The incidence of nodal positivity in patients with early breast cancer is low, and axillary lymph node dissection may not be justified in all such patients.

Design: Retrospective case series.

Setting: Tertiary institution.

Patients: All patients with T1a and T1b breast cancer who had both primary breast surgery and axillary lymph node dissection at Mayo Clinic in Jacksonville, Fla, from January 1, 1992, through February 28, 1998.

Interventions: None.

Main Outcome Measures: Tumor size and biological grade, estrogen and progesterone receptor status, number of nodes harvested, and number of nodes positive for disease.

Results: Of 163 patients studied, 39 had T1a and 124 had T1b tumors. Node positivity was 0% for T1a and 11.3% for T1b tumors (P = .03). Lymph node involvement and estrogen receptor status were not related (P = .29). However, the risk of lymph node positivity for progesterone receptor–negative (P = .01) and estrogen receptor–negative/progesterone receptor–negative tumors was significantly higher than for progesterone and estrogen/progesterone receptor–positive tumors (P = .04). Furthermore, the risk of lymph node positivity was significantly higher as tumor size increased (P = .002). Finally, higher tumor grade conferred a higher risk of lymph node involvement (P = .02).

Conclusions: T1a tumors have minimal risk of nodal positivity and may not require subsequent axillary lymph node dissection in the future. T1b tumors should be managed with routine analysis of axillary lymph node status. Whether sentinel node mapping can change this standard awaits further study.


Intial Management of invasive breast cancer involves a surgical procedure to establish local control and to determine the presence or absence of risk factors for recurrence, knowledge of which is used to guide subsequent management decisions. Currently, axillary lymph node dissection (ALND), with a minimum of 10 nodes harvested from axillary levels I and II, is a standard part of surgical treatment for patients with invasive breast cancer, regardless of tumor size. The continued inclusion of complete ALND in patients with small tumors (≤10 mm) has been a subject of controversy for several years.1-4 Some authors have suggested that the incidence of node positivity is so low that routine ALND should be eliminated. Others have maintained that it should remain the standard of care because of its role in determining prognosis and making decisions about adjuvant systemic therapy.

Nodal status is the most important prognostic factor for patients with resectable breast cancer.3,5,7 However, ALND probably contributes very little to overall survival and is associated with considerable morbidity and a potential decrease in quality of life.3-8 Warmuth et al6 showed that numbness or pain develops in 33% of patients and arm edema in 15%; 8% have limitation of arm movement and report episodes of infection or inflammation after ALND.

Some authors have reported a low incidence of axillary lymph node involvement in small tumors, but results have varied widely among different single-institution studies. Axillary node involvement has been documented in as few as 3% and as many as 23% of patients with T1a (≤5-mm) or T1b (6- to 10-mm) tumors.6-17 Of the 339 T1a tumors analyzed in the Surveillance, Epidemiology, and End Results Program of the National Cancer
PATIENTS AND METHODS

All patients with T1a or T1b tumors treated at Mayo Clinic, Jacksonville, Fla, from January 1, 1992, to February 28, 1998, were identified through the Mayo Clinic Tumor Registry. Each medical record was reviewed and the following data were recorded: tumor size, histologic type, tumor grade, hormone receptor (estrogen [ER] and progesterone [PR]) status, number of harvested nodes, and number of nodes positive for disease. We examined the influence of ER and PR status, tumor size (both grouped and continuous) and grade, and number of nodes pathologically evaluated on the likelihood of finding at least 1 lymph node positive for disease. The χ² test was used to measure the association of axillary lymph node positivity with hormone receptor status. The Wilcoxon rank sum test was used to measure the association of axillary lymph node positivity with tumor size, tumor grade, and number of lymph nodes examined. Stepwise logistic regression analysis was used to determine the set of variables that best predicted lymph node involvement.

Institute, 20.6% of the nodes were positive for disease. Chontos et al suggested that the data from the Surveillance, Epidemiology, and End Result Program were flawed, because histologic confirmation of axillary lymph node status was not required. White et al reported that patients with T1a and T1b tumors who did not undergo ALND had a reduction in overall, disease-free, and breast cancer–specific survival compared with that of patients with similar tumor stage who had pathological assessment of axillary lymph node status by dissection.

The aim of our study was to develop an institutional database of lymph node status based on the size of the primary breast cancer as an aid to making future decisions about management of T1a and T1b tumors.

RESULTS

From January 1, 1992, through February 28, 1998, 50 patients with T1a breast cancer and 144 with T1b breast cancer underwent lumpectomy or mastectomy with ALND at Mayo Clinic. Two of the 194 patients were men. Four observations were documented from 2 women, each of whom had 2 tumors. Of the 194 patients, 163 had data available about nodal status. Thus, the rest of the analysis was concerned only with these patients. For all patients, the median number of lymph nodes harvested was 13 (range, 2-42). Lymph node involvement was documented in 8.6% of the entire group of patients (n=163) with T1a and T1b tumors (Table 1). None of the patients with T1a tumors had documented lymph node involvement, but 11% of those with T1b tumors had at least 1 lymph node positive for malignancy (P=.03). T1a tumors were ER positive in 74.3% of patients, PR positive in 94.3%, and ER/PR positive in 74.3%; T1b tumors were ER positive in 88.8%, PR positive in 86.2%, and ER/PR positive in 80.2%. The association between ER status and axillary lymph node positivity was not significant (P=.29 for difference in nodal status between patients with ER-negative tumors and those with ER-positive ones) (Figure 1). However, there was a significantly higher risk (P=.01) for nodal involvement in patients with PR-negative tumors (23.5% were node positive) than in those with PR-positive tumors (6.0% were node positive), and in patients with ER/PR-negative tumors compared with those with ER/PR-positive tumors (25.0% vs 5.9%; P=.04).

Axillary lymph node involvement was correlated with larger tumor size (median, 10 mm vs 8 mm; P=.002; Figure 2). Of 14 tumors with positive lymph nodes, 11 tumors had a diameter of 10 mm. Node-positive tumors also had higher histologic grade: 10 of 14 node-positive tumors were grade 3 or higher (P=.02; Figure 3). No histologic tumor type demonstrated higher risk of lymph node involvement. After adjustment for tumor size in the multivariate analysis, only the number of nodes examined predicted for axillary node positivity.
nerves, and a 2% to 30% incidence of arm edema.4,6,10 Our numbness in the distribution of the intercostal brachial ity, with 10% to 20% of patients having decreased range than ideal test.4 Also, ALND confers significant morbid-
city should be corroborated in larger data sets.

A relationship between PR status and lymph node posi-
tors, but not in those with T1a tumors. Our finding of
use of adjuvant systemic therapy in patients with T1b tu-
ners) until data suggesting the valid-
tors may be considered the standard of care, it should be per-
formed as part of clinical studies until it has been dem-
onstrated to be accurate enough for the individual prac-
ting surgeon.

We propose to continue to assess the nodal status of patients with small invasive breast cancer (especially those with T1b tumors) until data suggesting the validity of SLND allow it to be the new standard of care. We anticipate that SLND will soon replace the old standard of ALND as the procedure of choice.

We thank Lenay Washington for her expert secretarial as-
sistance in preparation of the manuscript.

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The need for ALND in the management of T1a or T1b breast tumors is controversial. Other investigators have reported axillary node positivity rates of 3% to 12% for T1a and 11% to 23% for T1b tumors (Table 2). In our study, pathological evaluation of axillary lymph nodes had the potential to change prognosis and to affect the use of adjuvant systemic therapy in patients with T1b tu-
ners, but not in those with T1a tumors. Our finding of a relationship between PR status and lymph node posi-
tivity should be corroborated in larger data sets.

Although ALND may provide important prognostic information with therapeutic implications, its associ-
ated morbidity and added financial cost make it a less than ideal test.4 Also, ALND confers significant morbid-
ity, with 10% to 20% of patients having decreased range of motion of the shoulder, an approximately 80% rate of numbness in the distribution of the intercostal brachial nerves, and a 2% to 30% incidence of arm edema.6,10 Our data suggest that routine ALND may not be indicated in patients with T1a invasive breast cancer, but it is useful in those with T1b tumors.

In the future, sentinel lymph node detection (SLND) and biopsy are likely to be an alternative to ALND for many women in whom the sentinel node is negative. The rationale, technique, sensitivity, and specificity of SLND have been discussed elsewhere.21–23 In expert hands, this procedure identifies the sentinel node in more than 90% of women. However, several facts need to be acknowl-
edged before sentinel lymph node detection is consid-
ered a standard substitute for ALND. The procedure can be technically challenging, and both the location of the primary tumor and the experience of the multidisciplinary team (surgeon, nuclear medicine physician, and pathologist) influence its accuracy. The type of patho-
logical evaluation (the standard hematoxylin-eosin stain vs immunohistochemistry and polymerase chain reaction) might influence the positivity rate. The effect on prognosis of lymph node positivity detected by immu-
nohistochemistry or polymerase chain reaction and the subsequent implication for adjuvant therapy for pa-
tients who have had SLND as the only method to assess axillary status is uncertain. Therefore, before SLND may
be considered the standard of care, it should be per-
formed as part of clinical studies until it has been dem-
onstrated to be accurate enough for the individual prac-
ting surgeon.

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Table 2. Incidence of Axillary Lymph Node Metastases for T1a and T1b Invasive Breast Cancer

<table>
<thead>
<tr>
<th>Source</th>
<th>No. of Patients</th>
<th>Lymph Node Positivity, %</th>
<th>No. of Patients</th>
<th>Lymph Node Positivity, %</th>
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<tr>
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<td>3</td>
<td>156</td>
<td>17</td>
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</table>

*aCombined data from review of single-institution trials.

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