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Presentation

Utility of ultrasound and fine-needle aspiration biopsy of the axilla in the assessment of invasive lobular carcinoma of the breast

Judy C. Boughey, M.D.[a], Lavinia P. Middleton, M.D.[b], Lori Harker, P.A.-C.[a], Betsy Garrett, P.A.-C.[a], Bruno Fornage, M.D.[c], Kelly K. Hunt, M.D.[a], Gildy V. Babiera, M.D.[a], Peter Dempsey, M.D.[c], Isabelle Bedrosian, M.D.[a,*]

[a]*Department of Surgical Oncology, The University of Texas M.D. Anderson Cancer Center, 1400 Holcombe Blvd, Houston, TX 77030, USA*
[b]*Department of Pathology, The University of Texas M.D. Anderson Cancer Center, 1400 Holcombe Blvd, Houston, TX, USA*
[c]*Department of Breast Imaging, The University of Texas M.D. Anderson Cancer Center, 1400 Holcombe Blvd, Houston, TX, USA*

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Abstract

Background: The unique growth pattern of invasive lobular carcinoma (ILC) poses a challenge for preoperative assessment of disease extent within the breast. Whether it similarly limits lymph node staging by ultrasound (US) and fine-needle aspiration (FNA) biopsy was the subject of the current study.
Methods: A total of 217 patients with ILC who underwent axillary US were reviewed. FNA biopsy was performed when US findings were suspicious or indeterminate. Findings were compared to literature reports of US in invasive ductal carcinoma (IDC) patients.
Results: Axillary US was negative in 137 patients (63%) and suspicious or indeterminate in 80 patients (37%). FNA biopsy was positive in 62% (47/76 patients). Preoperative US and FNA biopsy identified 43 of 111 (39%) node-positive patients. Sensitivity of US with FNA biopsy correlated with primary tumor and nodal metastasis size. Similar results were seen in IDC populations.
Conclusion: US with FNA biopsy appears to be similarly useful in axillary staging of ILC and IDC patients.

Keywords: Axillary ultrasound; Breast cancer; Nodal staging; Fine-needle aspiration biopsy; Invasive lobular carcinoma

Ultrasound (US) of the breast and regional lymph nodes is increasingly being used as an adjunct to physical examination to improve the preoperative clinical staging of patients with breast cancer. This additional staging information provides several advantages: it allows patients with documented nodal metastases at presentation to be considered for neoadjuvant chemotherapy, and it allows lymph node–positive patients to proceed directly to axillary lymph node dissection (ALND) without the need for sentinel lymph node (SLN) surgery, thus minimizing the risks, costs and time associated with the surgical treatment, as well as decreasing the need for a second axillary operation should the SLN prove to be positive on final pathology.

The average sensitivity of US for the detection of nodal metastases across multiple studies has been reported to be 44% with an average specificity of 93% [1–5]. The addition of US-guided fine-needle aspiration (FNA) biopsy increases the sensitivity of nodal staging to 45% and specificity to 100% [2–7]. However, few reports have specifically addressed this staging approach in patients with invasive lobular carcinoma (ILC). The rate of lymph node involvement has been reported to be similar between ILC and invasive ductal carcinoma (IDC) in some studies [8] and higher than in IDC in other studies [9]. However, because it is substantially less common than IDC there are no studies focusing on preoperative axillary staging of ILC, although it is known that ILC has distinctive clinical and biological characteristics compared with IDC [5,10]. It has been hypothesized that the infiltrative pattern of metastatic spread to the lymph node preserving the nodal architecture makes US interpretation of the node chal-

* Corresponding author. Tel.: +1-713-563-1872; fax: +1-713-745-1462.
E-mail address: ibedrosian@mdanderson.org

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lenging. The uniform appearance of bland tumor cells that lack cellular atypia and often have a low mitotic rate make lobular carcinoma cells more difficult to detect as metastatic deposits in lymph nodes [8] and therefore more difficult to identify on FNA cytology.

We sought to test this hypothesis by evaluating the reliability of US with FNA biopsy of the regional nodes in patients with ILC to determine whether the histology of the breast primary affects the sensitivity of preoperative US nodal staging.

Methods

Patient population

All patients diagnosed with pure invasive lobular breast cancer at our institution between May 1998 and August 2005 were identified retrospectively from the surgical pathology database. At our institution we routinely stage all breast cancer patients at presentation with physical examination, mammography, and US of the breast and regional nodal basins. Patients with ILC who underwent preoperative axillary US followed by surgery at our institution were selected for this study. Approval for the study was obtained from the M.D. Anderson Cancer Center Institutional Review Board.

Regional nodal US and FNA biopsy

The breast and ipsilateral axilla were examined clinically and by US on presentation to the M.D. Anderson Cancer Center. US evaluation of the whole breast and ipsilateral nodal basins, including the axilla, infraclavicular, and supraclavicular regions and the internal mammary chain, were performed as described by Fornage [11]. US was performed by a radiologist using 7.5- to 12-mHz transducers. Findings at axillary US examinations were classified in 3 categories: suspicious, indeterminate, or benign. Suspicion was based on the presence of an asymmetric, hypoechoic prominence of the cortex. US-guided FNA biopsy was performed for pathological confirmation in all cases of suspicious US findings and at the radiologist's discretion when the US was judged as indeterminate. FNA biopsy of lymph nodes was performed by a radiologist using US guidance to target the abnormal area of the node.

Patient treatment and staging

Chemotherapy was given, when indicated, in the neoadjuvant or adjuvant setting at the discretion of the medical oncologist. At the time of surgery, patients underwent segmental mastectomy or mastectomy for resection of the primary tumor and sentinel lymph node surgery or axillary lymph node dissection as deemed appropriate by the surgical oncologist. Pathological staging was based on the final pathology report after completion of all surgical therapy. The size of the largest nodal metastasis was determined by measuring the single largest metastatic deposit in the lymph node. Lymph nodes with the largest metastasis measuring greater than .2 mm were classified as positive nodes.

Statistical analysis

Statistical analysis of continuous variables was performed using a Student *t* test and differences in the distribution of characteristics between groups were determined with Fisher exact test. *P* values $\leq .05$ were considered to be statistically significant.

Results

Patient and tumor characteristics

Two hundred seventeen women with a diagnosis of pure ILC who had undergone axillary US followed by surgery at the M.D. Anderson Cancer Center were identified. Patient

Table 1
Characteristics of study cohort

Variable	No. of patients	%
Age		
Mean	57.5	
Range	35–86	
Method of diagnosis of breast cancer		
FNA biopsy	6	3
Core biopsy	166	76
Excisional biopsy	45	21
Palpable primary tumor		
Yes	150	69
No	67	31
Palpable axillary lymph nodes		
Yes	53	24
No	164	76
Clinical tumor stage		
T1	108	50
T2	73	34
T3	28	13
T4	8	3
Clinical node stage		
N0	164	75
N1	43	20
N2	2	1
N3	8	4
Clinical stage		
I	99	46
IIA	58	27
IIB	34	16
IIIA	11	5
IIIB	7	3
IIIC	8	3
Pathological tumor stage		
pCR	1	1
T1	100	46
T2	79	36
T3	29	13
T4	8	4
Pathological node stage		
N0	106	49
N1	60	28
N2	24	11
N3	27	12
Pathological stage		
pCR	1	1
I	67	31
IIA	55	25
IIB	33	15
IIIA	28	13
IIIB	6	3
IIIC	27	12

FNA = fine needle aspiration; pCR = pathologic complete response.