Lobular Neoplasia on Core-Needle Biopsy—Clinical Significance

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BACKGROUND. Approximately 25% of all cases of atypical ductal hyperplasia (ADH) diagnosed on core biopsy of the breast are associated with ductal carcinoma in situ (DCIS) or invasive malignancy at the same site. As a result, surgical excision has become the standard of care for patients with ADH. In contrast, because data on the relation between breast malignancy and lobular neoplasia (LN) detected on core biopsy are limited, clinical management of patients with LN remains controversial. The goal of the current study was to determine the incidence of breast carcinoma at sites of core biopsy exhibiting LN compared with sites of core biopsy exhibiting ADH.

METHODS. The results of 2053 core biopsies were reviewed to identify cases of LN and cases of ADH. Follow-up findings on excisional biopsy were categorized as malignancy (DCIS or invasive malignancy) or no malignancy and were compared between the LN group and the ADH group. Mammograms and medical records were reviewed for patients with atypical findings on core biopsy.

RESULTS. One hundred six (5.2%) of 2053 biopsy samples exhibited atypia on core biopsy. Among these 106 samples, ADH was found in 49 (46%), LN was found in 45 (42%), and both ADH and LN were found in 12 (12%). Malignant disease was detected on follow-up excisional biopsy in 22% of patients with ADH (9 of 41), 14% of patients with LN (3 of 21), and 33% of patients with both ADH and LN (4 of 12) on core biopsy. In the LN group, two cases of malignant disease were associated with lobular carcinoma in situ, and the third case was associated with atypical lobular hyperplasia. Mammographic and clinical features were unable to distinguish patients with malignant findings on excisional biopsy from patients without malignant findings.

CONCLUSIONS. Malignant disease was found in a substantial percentage of excisional biopsy samples (14%) following the detection of LN on core biopsy. Thus, like patients with ADH, patients with LN on core biopsy could be considered candidates for surgical excision, which would allow full assessment of breast carcinoma risk and thereby facilitate the planning of prevention strategies.


KEYWORDS: lobular neoplasia, ductal carcinoma in situ, atypical ductal hyperplasia, core-needle biopsy, stereotactic core biopsy, lobular carcinoma in situ.

At present, core-needle biopsy with stereotactic or ultrasound guidance is widely used for the initial evaluation of small or clinically occult breast lesions, and this technique is preferred over open surgical biopsy for most patients.1 The accuracy of core biopsy in detecting invasive carcinoma of the breast2–11 is well documented; however, because core biopsy samples are relatively small, the primary concern regarding the detection of benign or premalignant lesions is that such findings on core biopsy may not accurately represent the entire targeted abnormality. Certain nonmalignant lesions
pose specific dilemmas with regard to identification of the most appropriate clinical management strategy (e.g., observation vs. surgical excision vs. chemoprevention) following core biopsy. This is especially true of atypical ductal hyperplasia (ADH) and lobular neoplasia (LN), which are uncommon enough that data on which to base rational management decisions are limited but which nonetheless occur frequently enough to generate constant debate regarding appropriate post-core biopsy management strategies.  

The reported incidence of ADH in core biopsy specimens is 2–5%. Significant discordance between findings of ADH on core biopsy and the subsequent findings of open biopsy have been reported, with approximately 25% of all cases of ADH detected by the former method being identified as either ductal carcinoma in situ (DCIS) or invasive malignancy by the latter method. These results have contributed to the recommendation that follow-up surgical excision be performed when ADH is detected on core biopsy.  

LN encompasses a spectrum of disease ranging from minimal atypical lobular hyperplasia (ALH) to lobular carcinoma in situ (LCIS). The reported incidence of LN in excisional biopsy samples ranges from 0.5–3.9%. A 10–20% risk of subsequent invasive breast carcinoma (IBC) is associated with a diagnosis of LN on surgical excision. Most of these IBCs (75%) occur in the ipsilateral breast, a finding that supports the concept of a direct relation between precursor and product. Unfortunately, limited data are available regarding findings on subsequent surgical excision for patients with LN identified on core biopsy. Therefore, the clinical significance of LN diagnosed on core biopsy and the corresponding therapeutic recommendations remain unclear.

The current study was undertaken to assess incidence rates of malignant disease (either invasive malignancy or ductal carcinoma) detected on follow-up excision after a diagnosis of ADH versus a diagnosis of LN on core biopsy and also to identify clinical, radiographic, and histologic characteristics that could be used to assess the likelihood of detecting ductal carcinoma in situ (DCIS) or invasive malignancy on excisional biopsy for patients with a diagnosis of LN on core biopsy.

**MATERIALS AND METHODS**

**Patient Population**

Patients with 1) histologically confirmed ADH, ALH, and/or LCIS on core biopsy in the absence of IBC or DCIS; 2) no clinical (i.e., symptomatic or palpable) evidence of malignancy in the breast in which the core biopsy had been performed; and 3) no previous IBC or DCIS in that same breast were included in the study. The study was approved by the Baylor College of Medicine (Houston, TX) Institutional Review Board.

**Identification of Patients**

The surgical pathology files of The Methodist Hospital (Houston, TX) were searched for cases evaluated between January 1998 and February 2002 in which core biopsy revealed the presence of ADH, ALH, or LCIS. Of a total of 2053 consecutive core biopsies, 106 (5.2%) revealed atypia or LCIS without malignant disease; these 106 cases were included in the current study. The cases included in the study were divided into 3 groups: ADH (n = 49), LN (n = 45), and ADH with LN (n = 12). For all cases, mammography and ultrasonography reports and films were collected for review. In addition, medical charts were reviewed to verify that none of the patients included in the study had clinical evidence of malignancy or a history of ipsilateral breast carcinoma and also to collect clinical information, such as age, family history of breast carcinoma, parity, hormone replacement therapy received, and history of contralateral breast carcinoma. Pathology files and clinical charts also were searched for information regarding supplementary procedures performed after core biopsy. Follow-up surgical excision was defined as a surgical procedure (e.g., mastectomy or needle-localized excision) that was performed within 6 months of the diagnostic core biopsy.

**Review of Imaging Studies**

Mammograms were reviewed by the study radiologist (D.C.) to confirm the reason for performing core biopsy. Abnormalities were grouped into the following categories: microcalcifications, microcalcifications with masses, masses alone, and architectural distortions. The study radiologist used the Breast Imaging Reporting and Data System (BI-RADS) lexicon to assign each mammographic abnormality a level of suspicion with respect to the harboring of malignant disease.

Core biopsy was performed using stereotactic or sonographic guidance. Stereotactic biopsy was performed using a directional, vacuum-assisted biopsy device (Mammotome; Biopsy/Ethicon Endo-Surgery, Cincinnati, OH) with an 11-gauge needle in 97 (91%) of 106 cases. The exact number of cores obtained varied from patient to patient, but approximately 10 cores were obtained during each biopsy. A specimen radiograph confirmed the presence of calcifications in each sample, and a clip was used to mark the biopsy site.
Sonographically guided biopsy was performed using a 14-gauge needle in 9 (9%) of 106 cases. Again, on average, approximately 10 cores were obtained from each site of abnormality. Radiologic findings were routinely reviewed to establish concordance with histopathologic diagnoses.

Histologic Review

The original diagnosis of atypia was made by the same study pathologist (D.C.A.) in almost all cases. For these cases, hematoxylin and eosin–stained slides of core biopsy samples and follow-up surgical excision samples were retrieved from the pathology archives and re-reviewed by a second study pathologist (S.K.M.) to confirm the diagnosis of ADH, ALH, LCIS, DCIS, or invasive malignancy using the criteria established by Page and Anderson. Each excision sample was classified, based on the histologic findings in the most significant lesion, as malignant (DCIS and/or IBC) or not malignant (ADH, ALH, LCIS, or other benign findings). Whenever a discrepancy existed between the histologic features of the core biopsy sample and the histologic features of the excision biopsy sample, the slides in question were re-reviewed by a study pathologist (D.C.A.) to ensure interpretive accuracy. Histopathologic findings were routinely reviewed to establish concordance with findings made on imaging studies. After diagnoses of ADH or LN on core biopsy were confirmed, lesion locations were analyzed for correlations with mammographic abnormality types. In all cases, calcifications were classified as being located within the lesion versus being located in the surrounding benign tissue, and all other benign histologic findings were recorded.

Data Analysis

Frequencies and proportions were calculated according to lesion diagnosis group for each variable analyzed. The rate of breast carcinoma detection on follow-up excision (along with the exact 95% confidence interval) also was calculated for each group. The Fisher exact test was used to compare outcomes as well as other characteristics across the three lesion diagnosis groups.

RESULTS

In total, there were 106 cases (5.2%) of atypia (i.e., ADH and/or LN) detected on core biopsy (Table 1). Among these 106 cases, there were 49 cases of ADH (46%), 45 cases of LN (42%), and 12 cases of ADH and LN detected together (12%). Of the 45 core biopsy samples that exhibited LN only, 37 (82%) contained ALH only, whereas 8 (18%) contained LCIS with or without ALH (Table 1). Diagnoses were confirmed in all cases.

Patient Demographics

The clinical characteristics of the study population also are summarized in Table 1. All patients were women. The median patient ages were 56 years (range, 34–78 years), 59 years (range, 37–85 years), and 61 years (range, 43–81 years) for patients diagnosed with ADH, LN, and LN + ADH, respectively. It is noteworthy that women with LN in the current series tended to be slightly older. This finding is discordant with published reports that LN is more common among younger women and may reflect unique characteristics of the screening population at our institution.

Overall, 46% of patients in the current series received hormone replacement therapy. Patients with LN detected on core biopsy were more likely to have a

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### Table 1

<table>
<thead>
<tr>
<th>Lesions detected on CNB (%)</th>
<th>ADH</th>
<th>LN</th>
<th>LN + ADH</th>
<th>( P ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>49 (46)</td>
<td>45 (42)</td>
<td>12 (12)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ADH:** atypical ductal hyperplasia; **LN:** lobular neoplasia; **LCIS:** lobular carcinoma in situ; **CNB:** core-needle biopsy; **IBC:** invasive breast carcinoma; **ALH:** atypical lobular hyperplasia.
family history of breast carcinoma in a first- or second-degree female relative compared with patients with ADH only and patients with LN + ADH (38% vs. 18% vs. 27%, respectively), but the differences across these three groups were not statistically significant ($P = 0.19$). Twenty-three percent of patients in the LN group had a synchronous or previous carcinoma in the contralateral breast, a finding that was similar to what has been observed in other studies.³⁰–³² This percentage was greater than the percentages of patients with contralateral breast carcinoma in the ADH only group (6%) and the LN + ADH group (17%) ($P = 0.06$). There were no significant differences among the three groups in terms of parity or history of benign biopsy findings.

**Radiographic Findings**

The mammographic abnormalities that prompted core biopsy are summarized in Table 2. All biopsied lesions had a BI-RADS classification of 4 (suspicious, requiring a biopsy). Calcifications alone represented the most common finding in all 3 groups (67% [LN group] vs. 80% [ADH group] vs. 50% [LN + ADH group]). An unexpected finding was that masses with or without calcifications were more commonly associated with diagnoses of LN on core biopsy (31% [LN group] vs. 16% [ADH group] vs. 42% [LN + ADH group]). Nonetheless, overall, the initially detected mammographic abnormality types were not significantly different in terms of frequency of occurrence across the ADH, LN, and LN + ADH groups ($P = 0.25$). In addition, patients in the LN group who underwent follow-up excision were not statistically significantly different from the LN group as a whole in terms of mammographic findings (Table 3).

**Histologic Findings on Core Biopsy**

Calcifications were detected on the mammograms of 43 of 46 (93%) patients diagnosed with ADH on core biopsy, 39 of 45 (87%) patients diagnosed with LN on core biopsy, and 8 of 12 (67%) patients diagnosed with ADH + LN on core biopsy (Table 2). On histologic review, calcifications were detected within the LN in 11 cases (28%) and within the ADH in 16 cases (37%). In addition, calcifications were found in 3 biopsy specimens (37%) that contained both ADH and LN. These findings indicate that LN was not necessarily a radiographically silent lesion.

The benign lesion most commonly associated with the diagnosis of atypia on core biopsy was hyperplastic unfolded lobules (HUL, also referred to as blunt duct adenosis or columnar alteration of lobules). Overall, the presence of HUL was detected in 37% ($n = 39$) of all cases. Usual ductal hyperplasia was diagnosed in 24% of cases, while sclerosing adenosis and radial scar were detected in 9% and 2% of cases, respectively. Of these benign findings, none was more common than any other in cases in which malignant disease was detected on excisional biopsy (data not shown). In addition, there was no statistically significant difference among the three study groups in terms of the incidence of any of these benign findings (data not shown).

**Histologic Findings on Follow-Up Surgical Excision**

Of the 49 patients with ADH detected on core biopsy, 41 (84%) underwent follow-up surgical excision (Table 4), which was performed by wire localization in 95% of these cases. Follow-up excision biopsy revealed nine malignancies (DCIS in all nine cases) among patients initially diagnosed with ADH.

Of the 45 patients diagnosed with LN on core biopsy, 21 (47%) underwent follow-up surgical excision. There was no statistically significant difference between patients who underwent follow-up excision and patients who did not in terms of any of the patient characteristics examined, including family history and previous contralateral breast carcinoma (Table 5). Follow-up excision involved wire localization in 19 cases and mastectomy in the remaining 2 cases. Three malignancies were found on follow-up excision—two

### TABLE 2

<table>
<thead>
<tr>
<th>Finding</th>
<th>ADH (n = 49)</th>
<th>LN (n = 45)</th>
<th>LN + ADH (n = 12)</th>
<th>$P$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcification</td>
<td>39 (80)</td>
<td>30 (67)</td>
<td>6 (50)</td>
<td>0.25</td>
</tr>
<tr>
<td>Calcification + mass</td>
<td>4 (8)</td>
<td>8 (18)</td>
<td>2 (17)</td>
<td>0.25</td>
</tr>
<tr>
<td>Mass</td>
<td>4 (8)</td>
<td>6 (13)</td>
<td>3 (25)</td>
<td>0.25</td>
</tr>
<tr>
<td>Architectural distortion</td>
<td>2 (4)</td>
<td>1 (2)</td>
<td>1 (8)</td>
<td>0.25</td>
</tr>
</tbody>
</table>

ADH: atypical ductal hyperplasia; LN: lobular neoplasia.

### TABLE 3

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Excision performed</th>
<th>Excision not performed</th>
<th>$P$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>21</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Mammographic findings (%)</td>
<td></td>
<td></td>
<td>0.51</td>
</tr>
<tr>
<td>Calcification</td>
<td>13/21 (62)</td>
<td>17/24 (71)</td>
<td></td>
</tr>
<tr>
<td>Mass with or without calcification</td>
<td>7/21 (33)</td>
<td>7/24 (29)</td>
<td></td>
</tr>
<tr>
<td>Architectural distortion</td>
<td>1/21 (5)</td>
<td>0/24 (0)</td>
<td></td>
</tr>
</tbody>
</table>
IBCs (one infiltrating lobular carcinoma and one infiltrating ductal carcinoma together with an infiltrating lobular carcinoma) and one DCIS (Table 4). The two IBCs were detected in patients diagnosed with LCIS on core biopsy, whereas the DCIS was detected in a patient diagnosed with ALH only on core biopsy. In two of the three cases in which malignant disease was detected, follow-up excision involved wire localization, with the malignancy being localized to the needle track. In the other case in which malignant disease (infiltrating lobular carcinoma alone) was detected, follow-up surgical excision consisted of mastectomy; in that case, the malignancy was adjacent to the LCIS detected on core biopsy.

All 12 patients who initially were diagnosed with both ductal and lobular atypia underwent follow-up surgical excision, which involved wire localization in 11 cases and mastectomy in 1 case. Four malignancies (DCIS [n = 2] and IBC [n = 2; infiltrating ductal carcinoma in both cases]) were detected on excisional biopsy.

Table 4 summarizes breast carcinoma incidence rates in the three study groups. The overall rate of malignant disease in the LN group was 14%. As in several other studies, this rate was lower than the corresponding rate in the ADH group (22%). Patients diagnosed with both ADH and LN on core biopsy had the highest breast carcinoma incidence rate (33%). Nonetheless, the three study groups were not statistically significantly different from each other in terms of breast carcinoma incidence (P = 0.47).

The radiologic findings associated with the detection of breast carcinoma on follow-up surgical excision are presented in Figure 1. In the LN group, two of the three patients with malignant disease had only calcifications detected on the initial mammogram; the third patient presented with calcifications as well as a mass. In the ADH group, all patients with malignant disease detected on excisional biopsy presented with calcifications alone on mammography. In the ADH + LN group, two patients with malignant disease presented with calcifications only, whereas the other two patients with malignant disease had calcifications and masses detected on their original mammograms. Thus, most patients diagnosed with breast carcinoma on follow-up excisional biopsy (13 of 16) presented with calcifications alone on mammography. Nonetheless, because the vast majority of patients who underwent follow-up excision (54 of 74) had only calcifications detected on their initial mammograms, we could not identify specific radiologic features that would be useful in prospectively selecting patients for follow-up excisional biopsy after the diagnosis of atypia on core biopsy.

**DISCUSSION**

There is no consensus regarding the incidence of breast carcinoma among patients diagnosed with LN on core biopsy, and the optimal clinical management...
strategy for such patients remains unclear. In addition, factors that can be used to predict the likelihood of detecting DCIS or IBC on excisional biopsy in patients diagnosed with LN on core biopsy have not been identified. In the current study, breast carcinoma was detected on follow-up surgical excision in 14% of women who were diagnosed with LN on core biopsy. Although this rate is lower than the corresponding rate for women diagnosed with ADH on core biopsy (22%), it is still substantial. In the current series, neither radiologic nor clinical features could distinguish cases in which malignant disease was detected on excisional biopsy from cases in which malignant disease was not detected on excisional biopsy.

Several reports on the histologic findings of excisional biopsy performed for patients diagnosed with LN on core biopsy have not been identified. In the current study, breast carcinoma was detected on follow-up surgical excision in 14% of women who were diagnosed with LN on core biopsy. Although this rate is lower than the corresponding rate for women diagnosed with ADH on core biopsy (22%), it is still substantial. In the current series, neither radiologic nor clinical features could distinguish cases in which malignant disease was detected on excisional biopsy from cases in which malignant disease was not detected on excisional biopsy.

To our knowledge, the largest investigation to date of the clinical significance of core biopsy findings was a retrospective review of 32,424 patients from a total of 13 institutions. Included in that series were 89 patients diagnosed with LCIS and 154 patients diagnosed with ALH on core biopsy. Twenty patients diagnosed with LCIS on core biopsy and 18 patients diagnosed with ALH on core biopsy were found to have malignant disease on follow-up excisional biopsy. The investigators in that study suggested that surgical excision was necessary in selected cases for patients diagnosed with LN. Significant limitations of the study included the lack of pathologic consensus review and the absence of data on radiographic correlations. Nonetheless, the overall results of that study are comparable to those of the current one.

Recently, Shin and Rosen suggested that the presence of florid LCIS on core biopsy should be considered an indication for surgery. Because LCIS is a more advanced lesion than is ALH, a difference in breast carcinoma incidence rates between patients with LCIS and patients with ALH would be expected, and studies with long-term follow-up have in fact demonstrated that the risk of developing breast carcinoma is greater for patients with LCIS than for pa-

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### TABLE 6
Review of Literature Reports on the Incidence of Breast Carcinoma Detected on Follow-Up Excisional Biopsy for Patients Diagnosed with Pure Lobular Neoplasia on Core Biopsy

<table>
<thead>
<tr>
<th>Study</th>
<th>LN on CNB</th>
<th>EXC performed</th>
<th>Carcinoma detected on EXC (%)</th>
<th>EXC performed</th>
<th>Carcinoma detected on EXC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dmytrasz et al., 2003</td>
<td>13</td>
<td>7</td>
<td>3 (43)</td>
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<td>0</td>
</tr>
<tr>
<td>Lechner et al., 1999</td>
<td>243</td>
<td>84</td>
<td>18 (21)</td>
<td>58</td>
<td>20 (34)</td>
</tr>
<tr>
<td>Pacelli et al., 2001</td>
<td>14</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>O’Driscoll et al., 2001</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>3 (43)</td>
</tr>
<tr>
<td>Berg et al., 2001</td>
<td>25</td>
<td>7</td>
<td>1 (14)</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Liberman et al., 1999</td>
<td>14</td>
<td>4</td>
<td>0</td>
<td>5b</td>
<td>0</td>
</tr>
<tr>
<td>Renshaw et al., 2002</td>
<td>71</td>
<td>6</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Shin and Rosen, 2002</td>
<td>13</td>
<td>5</td>
<td>0</td>
<td>8</td>
<td>2 (25)</td>
</tr>
<tr>
<td>Crisi et al., 2003</td>
<td>31</td>
<td>3</td>
<td>0</td>
<td>13</td>
<td>2 (15)</td>
</tr>
<tr>
<td>Philpotts et al., 2000</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1 (25)</td>
</tr>
<tr>
<td>Middleton et al., 2003</td>
<td>35</td>
<td>8b</td>
<td>4 (50)</td>
<td>9</td>
<td>2 (22)</td>
</tr>
<tr>
<td>Burak et al., 2000</td>
<td>6</td>
<td>6</td>
<td>1 (17)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bauer et al., 2003</td>
<td>13</td>
<td>7</td>
<td>1 (14)</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Zhang et al., 2001</td>
<td>18</td>
<td>8</td>
<td>0</td>
<td>10</td>
<td>3 (30)</td>
</tr>
<tr>
<td>Elsheikh and Silverman, 2001</td>
<td>22</td>
<td>15</td>
<td>1 (7)</td>
<td>7</td>
<td>3 (43)</td>
</tr>
<tr>
<td>Current study</td>
<td>45</td>
<td>17</td>
<td>1 (6)</td>
<td>4</td>
<td>2 (25)</td>
</tr>
<tr>
<td>Total</td>
<td>500</td>
<td>184</td>
<td>30 (16)</td>
<td>149</td>
<td>40 (26)</td>
</tr>
</tbody>
</table>

*LN: lobular neoplasia; CNB: core-needle biopsy; ALH: atypical lobular hyperplasia; EXC: excisional biopsy; LCIS: lobular carcinoma in situ.*

* Ductal carcinoma in situ or invasive breast carcinoma.

b Four cases of lobular carcinoma in situ excluded by the investigators, two of these had carcinomas.

c Includes only patients for whom pathologic examination was performed following immediate excision of lobular neoplasia diagnosed on core-needle biopsy.

d Two cases of atypical lobular hyperplasia were classified as lobular neoplasia by the investigators.

e All of these cases were classified as lobular neoplasia by the investigators.
patients with ALH. Nonetheless, the diagnostic criteria that have been described by various investigators for LCIS and ALH are somewhat subjective, and the limited amount of breast tissue obtained by core biopsy can make accurate distinction between LCIS and ALH difficult. In the current study, ALH and LCIS were grouped together under the umbrella of lobular neoplasia.

Two of the three malignancies detected on follow-up excisional biopsy in the LN group were associated with findings of LCIS in multiple cores on the initial core biopsy. The third malignancy was detected in a patient in whom only a small focus of ALH (< 5 mm) was found on core biopsy. Nonetheless, because ALH and LCIS are essentially arbitrarily and subjectively defined subtypes of a single disease entity, some pathologists may consider certain lesions diagnosed as ALH in the current study to be LCIS, and vice versa.

Middleton et al. recently published a report on 35 patients diagnosed with LN on core biopsy. Seventeen of these patients subsequently underwent excisional biopsy. Invasive carcinoma was detected on excisional biopsy in 6 (35%; 4 with ALH and 2 with LCIS) of these 17 patients. All patients who were found to have IBC on excisional biopsy had masses on mammographic examination. (For one patient, the mass was identified retrospectively.) The investigators in that study concluded that for patients with LN, the most significant predictor of invasive carcinoma on excisional biopsy was a radiographically detected mass lesion or architectural distortion. In the LN group in the current study, only one patient with invasive breast carcinoma detected on follow-up excisional biopsy presented with a mass associated with calcifications on mammographic examination; in addition, none of the architectural distortions detected in this group were associated with malignant disease. Overall, a review of the radiologic findings for the 16 patients who had a final diagnosis of breast carcinoma failed to reveal any consistent distinguishing features. Therefore, unlike Middleton et al., we were unable to establish any criteria for ruling out follow-up excisional biopsy on the basis of initial mammographic findings.

The radiologic presentation of LN on mammography has been examined by several investigators. Conventional wisdom holds that LN is an incidental finding in areas adjacent to benign, mammographically detected calcifications and that calcifications are only rarely associated with LN. Carson et al. found calcifications in association with LCIS in 21% of mammographically detected lesions (4 of 19), and Crisi et al. reported colocalization of calcifications with LN in 41% of cases (12 of 29). In the current study, calcification was the initial mammographic abnormality that prompted core biopsy in 67% of cases in the LN group, compared with 80% of cases in the ADH group. Colocalization of calcifications with lesions was observed in 28% of cases in the LN group and 37% of cases in the ADH group. This relatively high rate of colocalization in the former group (which encompasses classic LCIS and ALH), in agreement with the findings of a previous study, should prompt a reevaluation of the traditional view that LN is not associated with radiographically detectable abnormalities.

The detection of both ADH and LN on core biopsy has been found to be associated with the diagnosis of carcinoma on follow-up excision in many studies and has been considered an additional indication for surgical biopsy. In the current study, the rate of detection of malignant disease on follow-up excisional biopsy was highest in the ADH + LN group (33%) compared with the other two study groups.

Limitations of the current study include the small number of patients, the retrospective nature of the analysis, and the fact that cases were not obtained from a randomized series of patients. The limited number of cases reviewed is a reflection of the rarity of instances in which excisional biopsy follows core biopsy detection of LN. In the current study, and especially for women diagnosed with LN on core biopsy, the reasons for performing excisional biopsy were analyzed to determine whether there was a bias with respect to the selection of patients to undergo surgical excision; no such bias in terms of clinical or radiologic characteristics was identified. A large, prospective, multinstitutional trial in which all patients underwent excision would be more conclusive, but practical issues make such a trial very difficult to perform; in addition, it still would not be possible to rule out investigator-initiated selection bias.

Together with the findings made in other studies (Table 6), the results of the current investigation provide substantial support for the use of excisional biopsy for patients diagnosed with LN on core biopsy, as approximately 10–20% of these patients have been found to have coexisting DCIS or invasive malignancy at or near the core biopsy site. The widespread use of excisional biopsy would represent a major change in the clinical management of this patient population.

REFERENCES


