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Appropriate Management of Atypical Ductal Hyperplasia Diagnosed by Stereotactic Core Needle Breast Biopsy

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Background: Stereotactic core needle breast biopsy (SCNBB) is a minimally invasive technique used to sample nonpalpable mammographic abnormalities. The optimal management of atypical ductal hyperplasia (ADH) diagnosed by SCNBB is unknown. We hypothesized that ADH diagnosed by SCNBB should be evaluated by excisional breast biopsy (EBB) because of the risk of identifying carcinoma in association with ADH that would be missed if a diagnostic sampling technique alone was utilized.

Methods: To test this hypothesis, a prospective diagnostic protocol was created which called for SCNBB instead of EBB for patients with mammographic abnormalities considered suspicious for malignancy. If ADH was noted on histologic evaluation of the cores, patients were advised to undergo an EBB.

Results: A review of the initial 900 patients evaluated by SCNBB yielded 39 patients (4.3%) with ADH detected by SCNBB. Thirty-six of these 39 patients agreed to proceed with EBB: 19 patients demonstrated benign findings including atypical ductal hyperplasia, 13 patients demonstrated noninvasive ductal carcinoma, and 4 patients had evidence of invasive carcinoma.

Conclusions: A 47% rate of detecting noninvasive or invasive breast carcinoma supports the hypothesis that ADH detected by a sampling technique, such as SCNBB, should be managed by EBB.

Key Words: Mammography—Breast biopsy—Atypical ductal hyperplasia—Breast carcinoma.

Breast cancer screening programs have been developed to diagnose malignancy at an early, more curable stage, and mammography has been the most important component of such programs. Mammography allows for the diagnosis of breast malignancy at a nonpalpable stage, when associated cure rates are greater than 90% (1,2). Unfortunately, the specificity of mammography is limited, resulting in a large number of abnormal mammograms which require further evaluation by excisional breast biopsy (EBB). In 1995, it was estimated that 500,000 breast biopsies were performed in the United States as a direct result of screening programs (3). Only 9% to 30% of these biopsies detected a breast malignancy, with the remainder identifying a variety of benign conditions which can mimic the appearance of small breast cancers on mammography (4–6). Breast cancer screening programs which employ EBB to evaluate all abnormal nonpalpable mammograms result in a large number of unnecessary surgical procedures which are expensive and may result in cosmetic deformity of the breast.

Stereotactic core needle breast biopsy (SCNBB), a new and minimally invasive technique, allows for a mammographic abnormality to be evaluated histologically by sampling the lesion with a core needle. SCNBB is an attractive alternative to EBB in the evaluation of mammographically detected lesions because it reduces the expense and cosmetic deformity associated with EBB for women with benign breast pathology. The acceptance of a benign SCNBB result requires that the histologic

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evaluation of the core accurately reflects the extent of the pathologic process responsible for the mammographic abnormality.

A diagnosis obtained by SCNBB which may not reflect the extent of breast pathology is atypical ductal hyperplasia (ADH). ADH is hypothesized to bridge the continuum from nonatypical hyperplasia to noninvasive ductal carcinoma (7). ADH when diagnosed by EBB places a patient at increased risk of breast malignancy but is generally managed by close observation. ADH can coexist adjacent to an area of noninvasive or invasive breast carcinoma. The result of a sampling technique such as SCNBB that is interpreted as ADH may miss an adjacent focus of carcinoma. SCNBB provides small fragments of breast tissue for histologic interpretation which may be insufficient for the pathologist to appreciate the subtle differences between pathologic entities. Therefore, the hypothesis of this study was that all patients with a SCNBB diagnosis of ADH should be evaluated by EBB because of the potential for coexisting breast carcinoma which might only be detected if the entire part of the breast corresponding to the mammographic abnormality is evaluated.

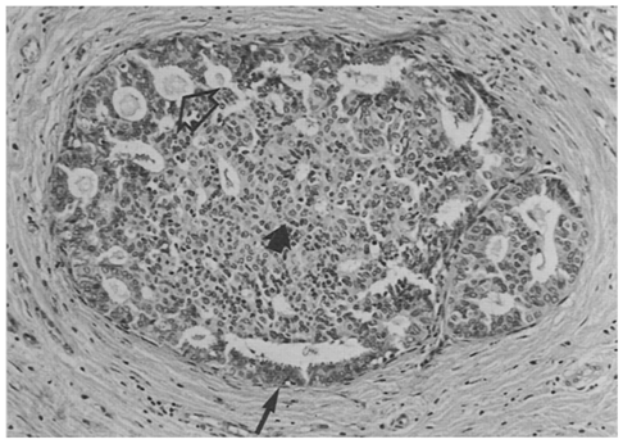

FIG. 1. Histologic example of atypical ductal hyperplasia. The duct is filled centrally with a uniform population of cells (short arrow). Additionally, the holes in this population of cells are generally round (open short arrow). Both features argue for a diagnosis of ductal carcinoma in situ, but the peripheral population of cells is quite varied (long arrow), and the area occupies less than 2 mm. The uniform cells and holes are criteria used to indicate ductal carcinoma in situ. However, because the peripheral cells are varied in their histologic architecture, all of the required diagnostic criteria are not present to achieve a diagnosis of ductal carcinoma in situ; thus the designation of ADH is made. Furthermore, even if the peripheral cells had been similar in architecture to the central cells, the entire abnormal area measures less than 2 mm so that the diagnosis of ADH would still hold. (Hematoxylin & eosin stain ×100.

METHODS

In July 1993, a diagnostic protocol was initiated which called for stereotactic core needle breast biopsy to be performed in order to evaluate all nonpalpable suspicious masses and calcifications noted on mammography. Excluded from consideration for stereotactic biopsy were lesions not clearly visualized in the stereotactic unit, usually lesions deep within the breast along the chest wall; lesions found in small breasts which compressed to less than 2 cm in the stereotactic unit; asymmetric dense breast tissue; and patients unable to tolerate the prone position for 30 minutes.

Patients consenting to the core biopsy procedure were placed prone on a designated stereotactic breast biopsy unit, and biopsy coordinates and depths were calculated from the images. Local anesthesia without intravenous sedation was employed and a 2 mm to 3 mm skin incision was made at the site of needle entry. A 14-gauge core needle was inserted into the breast and stereotactic images confirmed the pre-fire position of the core needle. A minimum of five cores were obtained for each lesion. When the indication for biopsy was a suspicious mass, post-fire images were obtained to confirm the passage of the needle across the index lesion. When cores were obtained for calcifications, magnified specimen radiographs were obtained to confirm the presence of calcifications in the excised cores of tissue. Specimens were placed in formalin and reviewed by staff pathologists. In cases of calcifications, special attention was paid to assessing the excised cores for histologic evidence of calcifications. Frozen section evaluation was not performed. Core biopsy material was serially sectioned by the pathologist, and when a diagnosis of atypical ductal hyperplasia was made, our protocol required that patients be advised to undergo a wire-localized EBB.

Several criteria must be satisfied in order to differentiate atypical ductal hyperplasia from the more benign nonatypical hyperplasia and the more ominous intraductal carcinoma. Among the criteria used to diagnose intraductal carcinoma are a uniform population of cells with hyperchromatic nuclei; distinct cell borders; delicate non-vascularized papillary fronds of uniform hyperchromatic cells; and comedonecrosis. The presence of some of these cytologic and architectural features in ducts which also display the remnants of nonatypical ductal hyperplasia have led to the concept of atypical ductal hyperplasia (7–11). Rarely, diagnostic features of intraductal carcinoma are noted, but are present in only one duct or occupy a diameter of less than 2 mm (10). In these cases, the diagnosis of atypical ductal hyperplasia is made (Fig. 1).

RESULTS

From July 1993 through February 1996, 900 patients were evaluated by stereotactic core needle breast biopsy at The Ochsner Clinic. Atypical ductal hyperplasia was diagnosed in 39 patients (4.3%). The mammographic abnormalities noted in these 39 patients are listed in Table 1. A mean of 7.2 cores were sampled from each mammographic abnormality with a range of 5 to 18 cores. The only complication noted in these 39 patients was the development of ecchymosis along the core needle tract, which resolved without treatment in all cases. Three patients refused EBB; all three have been contacted by telephone, claim to be asymptomatic, and, despite urging, continue to refuse surgical biopsy.

A total of 36 patients consented to wire-localized EBB based on the findings of the SCNBB which demonstrated ADH. The histologic findings are summarized in Table 2. Benign proliferative breast pathology was identified in nine cases. In the opinion of the pathologist, the criteria for atypia which were noted in the core specimens could not be demonstrated in the excised material. Intraductal carcinoma was identified in 13 cases and invasive carcinoma was noted in four, for a total of 17 (47.2%) patients.

DISCUSSION

The 47% rate of malignancy demonstrated by this study supports our hypothesis that mandates EBB when the diagnosis of ADH is made by SCNBB. Recent reports in the radiology literature, based on smaller clinical sample size than our study, further support the use of EBB for patients with ADH on SCNBB (12–14). The decision to proceed with EBB ultimately must be made by the surgeon, and it is critical that information from studies evaluating core breast biopsy be disseminated to surgeons. This study represents the initial report in the surgical literature of patients evaluated by core needle biopsy with a finding of atypia.

A possible explanation for the findings of this study is that the tissue for pathologic examination supplied by the core biopsy technique is small. Criteria used to make a diagnosis of atypical ductal hyperplasia include all of the findings associated with intraductal carcinoma, but involving a diameter of less than 2 mm or involvement of more than one duct. While these designations may seem arbitrary, evidence indicates that patients with ADH have a more benign natural history than those with fully developed duct carcinoma in situ (7–11). A core of tissue which demonstrates less than 2 mm of pathology or involvement of only one duct is appropriately diagnosed as atypical, reserving the diagnosis of carcinoma for the completely excised specimen.

Another possible explanation for the high rate of malignancy noted in this study is the possibility that foci of atypia can coexist in areas adjacent to foci of carcinoma. A sampling technique can theoretically miss adjacent areas of carcinoma. As the number of core specimens increases, the possibility for a discordant diagnosis between the core and the EBB should decrease. We have settled on removing a minimum of five cores from every radiographic abnormality. Certainly, as the number of cores removed increases, the possibility of increased complications is a consideration. An additional concern is that if a large number of core specimens are removed, the area in question on the mammogram may become poorly defined, making future excision for malignancy more difficult. In our opinion, the appropriate number of core biopsies to remove in each case is the number which can be relied upon to be certain that a given mammographic abnormality is benign and therefore does not need to be excised.

Stereotactic and other forms of image-guided breast biopsies are coming into wider use, and surgeons must become familiar with these new techniques and the interpretation of the data they provide. Cooperation between the radiologist, pathologist, and surgeon will be critical to ensure that high-quality evaluation of mammographic abnormalities is available for women. Each

TABLE 1. *Mammographic indication for biopsy in patients with SCNBB diagnosis of ADH*

Mammographic abnormality	No. of patients
Mass	7
Calcifications	28
Mass + Calcifications	4

ADH, atypical ductal hyperplasia; SCNBB, stereotactic core needle breast biopsy.

TABLE 2. *Pathologic findings noted at excisional breast biopsy for patients diagnosed with ADH by SCNBB*

Mammographic abnormality (N)	Pathology from excisional breast biopsy			
	Benign	ADH	DCIS	IBC
Mass (7)	5	1	1	0
Calcifications (25)	3	8	11	3
Mass + Calcifications (4)	1	1	1	1
Total (36*)	9	10	13	4

* Three of the 39 patients with ADH refused excisional breast biopsy.

ADH, atypical ductal hyperplasia; DCIS, ductal carcinoma in situ; IBC, infiltrating breast carcinoma.

institution will develop roles for these specialists, depending on a variety of factors unique to the institution. We strongly believe that the surgeon must continue to play a key role in the evaluation of mammographic abnormalities so that patients can benefit from the surgeon's clinical expertise in the evaluation of breast disease.

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