Can Mucinous Lesions of the Breast Be Reliably Diagnosed by Core Needle Biopsy?

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Abstract

Lesions of the breast containing extravasated mucin span a continuum from benign mucoceles to invasive mucinous (colloid) carcinoma. It is well known that distinguishing benign from malignant mucinous lesions is difficult in fine-needle aspiration material. Whether these lesions also are difficult to distinguish in core needle biopsy material is not known. To address this, I reviewed the results of 4,297 breast core needle biopsies. Mucinous lesions were identified in 22 cases (0.51%), and excisional biopsy material was available for 15 of these. At excision, 0 of 8 benign mucinous lesions showed carcinoma, while 7 of 7 mucinous lesions associated with carcinoma at the time of core needle biopsy showed carcinoma at excision. The vast majority of mucinous lesions of the breast can be diagnosed accurately by core needle biopsy. Whether all such lesions require excision is not known at this time.

Mucinous lesions of the breast consisting of extravasated mucin are relatively uncommon and include a variety of lesions that span a continuum from benign mucoceles to invasive mucinous (colloid) carcinoma. It is well known that distinguishing benign from malignant mucinous lesions can be difficult in fine-needle aspiration material. Perhaps as a result of this experience, many centers, including mine, have been reluctant to definitively classify these lesions on core needle biopsy alone and, consequently, have routinely recommended excision for all mucinous lesions identified by core needle biopsy. However, perhaps because the lesion is relatively uncommon, to date there are few data to either support or contradict such a practice. To address this, I reviewed the results of a large series of breast core needle biopsies and correlated the results of surgical excision with the initial classification of mucinous lesions on the basis of core needle biopsy.

Materials and Methods

The results of breast core needle biopsy specimens interpreted from August 20, 1996, to August 31, 2001, at Baptist Hospital of Miami, Miami, FL, were reviewed. All biopsies with a diagnosis of a mucinous lesion consisting of extravasated mucin were identified and correlated with the results of the subsequent excision.

All breast core needle biopsy specimens were obtained by the clinicians, and more than 95% were performed by the radiology department and consisted almost exclusively of 11- and 14-gauge core needle biopsy specimens obtained under ultrasound or stereotactic guidance.
All specimens were received fixed and were processed routinely. Up to 5 cores were processed in a single block; if more than 5 cores were present, then an additional block was prepared. Each block was entirely sectioned to produce at least 5 slides and 2 levels per slide.9

All cases in this series had mucin extravasated out of ducts into stroma, and I reviewed all cases and confirmed the original diagnosis. Cases were classified into 4 categories, and the criteria are similar to those used by others1-4: (1) those with only mucin and benign epithelial changes without adjacent atypical ductal hyperplasia, (2) those with only mucin and benign epithelial changes with adjacent atypical ductal hyperplasia, (3) those with extravasated mucin and adjacent ductal carcinoma in situ, and (4) those with mucin and either adjacent invasive carcinoma or islands of detached epithelial cells diagnostic of mucinous (colloid) carcinoma.

Statistical analysis was performed using a 2-tailed Fisher exact test.

### Results

Patient and lesion characteristics for the entire group of biopsies are detailed in Table 1. A total of 22 patients had mucinous lesions identified representing 0.51% of all breast core biopsies. These came from 22 women with a median age of 48 years (range, 33 to 74 years). Sixteen were from the right side and 6 from the left, and 14 were done for calcifications and 8 for a mass lesion.

Subsequent excision material was available for 15 patients, and these results are correlated with the findings for the original core needle biopsy in Table 2. In brief, in no case in which the original diagnosis was benign was the diagnosis from subsequent excision carcinoma, and in every case in which the original mucinous lesion was associated with carcinoma there was carcinoma in the excision. This difference was highly statistically significant ($P = .003$). Overall, there were 5 cases of invasive carcinoma at biopsy that at excision showed invasive carcinoma in 4 cases and ductal carcinoma in situ in 1 case; and there were 2 cases of ductal carcinoma in situ at biopsy, and at excision these showed 1 case of invasive carcinoma and 1 case of ductal carcinoma in situ. Interestingly, all the invasive carcinomas at biopsy were associated with a mass lesion, while all the other mucinous lesions were associated with calcifications. This difference also was highly significant ($P = .002$). The invasive carcinoma was the colloid type in 3 cases and consisted of extravasated mucin associated with an invasive ductal carcinoma, not otherwise specified, in 2 cases.

### Discussion

The goal of this study was simple: I wanted to determine whether mucinous lesions of the breast can be diagnosed reliably by core needle biopsy. No large studies specifically addressing this issue exist. In part, this relates to the rarity of this lesion. In the present series, I was able to identify only 22 cases from more than 4,000 biopsies. While the total number of cases in this series is relatively small, this represents the largest series of cases published so far, and the results are clear. The vast majority of mucinous lesions can be diagnosed correctly on core needle biopsy. Nevertheless, since the number of cases is relatively small, these results need to be confirmed by others.

There are several possible reasons for the high accuracy achieved. However, I believe that extensive sampling is critical for success at classifying mucinous lesions. Previously, it was suggested that the relatively low incidence of more significant lesions at excision after a diagnosis of either ADH11 or lobular neoplasia10 in this series of biopsies is most likely related to the relatively large amount of tissue removed at the time of the biopsy. The results from the present series would be consistent with that interpretation.

The exact significance of benign mucinous lesions is not entirely known. Some have suggested that these may be precursors of mucinous carcinomas.12 If so, excision may be prudent, even though the risk of carcinoma at the time of excision is low. In addition, although I have not found any cases of carcinoma after excision of benign mucinous lesions, it is certainly possible for only the mucin in a mucinous carcinoma to be sampled at the time of biopsy. Thus, although I believe the risk of carcinoma is relatively low, it may be prudent to continue to excise these lesions,
even if benign, at least until their significance is better understood. Nevertheless, these results suggest that it can be conveyed to the patient that the risk of malignancy in that excision seems low.

I have shown that most mucinous lesions of the breast can be classified correctly on the basis of core needle biopsy alone. Whether all such lesions need to be excised is not known.

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References