Core Needle Biopsy as a Diagnostic Tool to Differentiate Phyllodes Tumor From Fibroadenoma

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Hypothesis: Core needle biopsy is a useful diagnostic tool in differentiating phyllodes tumor from fibroadenoma.

Design: The radiology database was queried for patients who underwent core needle biopsies of fibroepithelial lesions that raised the possibility of phyllodes tumor. These diagnoses were then compared with the final pathological diagnoses after surgical excision.

Setting: The data were gathered from the Comprehensive Breast Center, Columbia Presbyterian Medical Center, a tertiary care, university-based medical center.

Results: From August 21, 1998, to December 14, 2001, 57 core needle biopsies were identified in which the specimen raised the possibility of phyllodes tumor. The median age of the patients was 42 years (range, 16-77 years). The median diameter of all lesions was 1.1 cm (range, 0.6-3.6 cm). Of the 57 specimens, 25 had core biopsies in which the pathological findings favored a diagnosis of fibroadenoma over phyllodes tumor. Twenty-three had initial core biopsies favoring phyllodes tumor. Nine of the core biopsies were equivocal. Of the 25 patients with specimens favoring fibroadenoma, excisional biopsy confirmed the diagnosis of fibroadenoma in 23, and phyllodes tumor was found in 2. The negative predictive value was 93%. Of the 23 core biopsies favoring phyllodes tumor, 19 were confirmed on excisional biopsy, while 4 were fibroadenoma. The positive predictive value was 83%. In the equivocal core biopsies, 5 were fibroadenoma and 4 were phyllodes tumor on final pathological analysis. None of the lesions studied were determined to be malignant on final analysis.

Conclusions: Core needle biopsy can significantly reduce the need for operative management of fibroepithelial lesions. A core needle biopsy with results favoring fibroadenoma should allow the breast physician to treat the lesion as a fibroadenoma, with observation and close follow-up or with enucleation. Core needle histologic examination of phyllodes tumor allows the physician to preoperatively plan the definitive management at one surgical procedure, reducing the need for reoperations.

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The use of large-core needle biopsy as a method of obtaining tissue specimens from lesions in the breast has rapidly gained acceptance in the field of breast surgery. Core needle biopsy can be performed in an outpatient setting, is minimally invasive, and has the potential for savings in this era of cost-containment. As a result, this technique for histologic assessment has virtually replaced excisional biopsy in the initial management algorithm. This change has reduced the morbidity associated with the diagnosis of palpable lesions of the breast. Much of the concern of the past was whether the histologic findings in the core needle biopsy specimens provide an accurate representation of the radiographically detected lesion. Although the technique represents a sampling process and false-negative results can occur, the sensitivity of the procedure in diagnosing malignant lesions can be as high as 99%. Because of the accuracy of the test, it has allowed definitive management to be performed at one operation. The success in the management of palpable lesions has resulted in the technique being applied in the assessment of radiographically detectable lesions. Its role in the initial diagnosis has been rapidly accepted, as stereotactic biopsy with mammographic guidance and ultrasound-guided biopsy are now commonly performed in the initial evaluation of clinically occult, nonpalpable breast lesions.

The diagnosis of fibroadenoma can usually be made based on the histologic features on core needle biopsy. When these lesions are diagnosed on core needle biopsy and the findings are concordant with
of the imaging and physical diagnosis, the lesions can be safely managed with observation or enucleation. A complicating situation that may be encountered involves samples of fibroepithelial lesions with increased stromal cellularity in which the differential diagnosis includes fibroadenoma and phyllodes tumor. Phyllodes tumors are uncommon enough to lack a well-defined, evidence-based diagnostic algorithm. Because of their clinical similarity to fibroadenoma, many are initially managed with enucleation, resulting in the frequent need for reoperation. We examined our patient database in an attempt to assess the efficacy of large-core needle biopsy in differentiating phyllodes tumor from fibroadenoma.

From 1998 to 2001, 2866 breast core needle biopsies were performed at our center. From these, 57 core needle biopsies were identified in which the diagnosis of phyllodes tumor could not be ruled out or was suspected. The median age of the patients was 42 years (mean, 41 years; range, 16-77 years) (Figure 1). The median age of the phyllodes tumor group and fibroadenoma group was similar at 43 and 42 years, respectively. There was a greater number of patients presenting in the age range of 30 to 39 years in the fibroadenoma group (9 vs 3). The median diameter of all lesions was 1.1 cm (range, 0.6-3.6 cm) (Figure 2). The median size in the fibroadenoma group was 1.0 cm (mean, 1.1 cm). The median size in the phyllodes tumor group was 1.3 cm (mean, 1.5 cm). The median size for the fibroadenoma group was 1.0 cm (mean, 1.1 cm).

METHODS

The Comprehensive Breast Center mammography database of Columbia Presbyterian Medical Center was queried for patients who underwent core needle biopsies between 1998 and 2001. We identified 65 female patients in whom 70 core needle biopsies were performed and the pathological findings raised the possibility of phyllodes tumor. Of the 70 lesions, 13 were not excised and therefore had no final pathology reports. These 13 patients were excluded. The excluded patients either did not return after the core needle biopsy, did not agree to undergo excision of the lesion and were unavailable for follow-up, or did not return for the operation. The remaining 57 lesions comprised the study group. Of the 57 lesions, 44 (77%) were palpable or detectable by ultrasonography. For these lesions, the core needle biopsies were performed using a 14-gauge (10 cm) spring-loaded biopsy instrument (Marian Medical Products, Northbrook, Ill; and Bard Urological, Covington, Ga). The remaining 13 (23%) were mammographically detected abnormalities. For these lesions, stereotactic core needle biopsies were performed using a prone stereotactic table (US Surgical, Norwalk, Conn) and dedicated imaging (Lorad, Danbury, Conn). Four of the specimens were obtained with an 11-gauge, vacuum-assisted device (Biopsys Medical Inc, Irvine, Calif). The remaining 9 were sampled under stereotactic guidance using the 11-gauge MammoTome vacuum-assisted device (Ethicon Endosurgical, Cincinnati, Ohio). Several passes were made to obtain the core samples from the lesions. For the 57 lesions, a mean of 6 (range, 2-25) core samples were obtained for each lesion. In the mammographically detected lesions, prebiopsy and postbiopsy images were used to confirm that the lesion had been successfully sampled.

All 57 lesions were excised because the core needle biopsy was diagnostic for phyllodes tumor or the diagnosis could not be completely excluded. The diagnosis on the pathology report of the initial core needle biopsy was then compared with the final pathological diagnosis after surgical excision. The patients were divided into 3 categories based on the core needle biopsy pathology reports. One group favored the diagnosis of fibroadenoma, the second favored phyllodes tumor, and the third was equivocal.

RESULTS

Figure 1. The median age of the patients was 42 years (range, 16-77 years). The median ages for patients with phyllodes tumor and fibroadenoma were 43 and 42 years, respectively.

Figure 2. The median diameter of all lesions was 1.1 cm (range, 0.6-3.6 cm). The median size in the phyllodes tumor group was 1.3 cm (mean, 1.5 cm). The median size for the fibroadenoma group was 1.0 cm (mean, 1.1 cm).
opsies were equivocal between the 2 diagnoses and no definite judgment was made.

Of the 25 lesions with core biopsies favoring fibroadenoma, excisional biopsy confirmed the diagnosis of fibroadenoma in 23, while 2 were determined to be phyllodes tumor (Table). Both of these phyllodes tumors were histologically benign. This made the negative predictive value 93%. Of the 23 core biopsies considered to be phyllodes tumors, 19 were confirmed on excisional biopsy, while 4 were determined to be fibroadenoma on final pathological analysis. The positive predictive value was therefore 83%. Among the core biopsies for which the pathologist could not give a definitive diagnosis, 5 were fibroadenoma and 4 were phyllodes tumors on the final pathology reports, giving a nearly equal distribution. None of the lesions studied were determined to be malignant on final pathological analysis.

### Initial and Final Diagnoses

<table>
<thead>
<tr>
<th>Core Biopsy Result</th>
<th>No. of Patients</th>
<th>Final Pathology Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favor fibroadenoma</td>
<td>25</td>
<td>23 fibroadenoma</td>
</tr>
<tr>
<td>Favor phyllodes tumor</td>
<td>23</td>
<td>4 fibroadenoma</td>
</tr>
<tr>
<td>Equivocal</td>
<td>9</td>
<td>5 fibroadenoma</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>32 fibroadenoma</td>
</tr>
</tbody>
</table>

Only 2 series in the literature have briefly mentioned core needle biopsy as part of the diagnostic evaluation of phyllodes tumor. The series reviewed 7 and 9 patients each. In one series, all cases were considered equivocal, described as “fibroadenoma vs phyllodes.” On excision, 3 were phyllodes tumors and 4 were fibroadenoma. In the other series, all 9 were considered “probable fibroadenoma with cellular stroma.” Of these, 7 were fibroadenoma and 2 were phyllodes tumor. The small numbers in these series are not unusual, as phyllodes tumor is an uncommon pathological finding. In reviewing our database, we discovered a higher incidence of phyllodes tumors at our institution compared with other reported series. An epidemiologic study found that Latin Americans showed an increased incidence of phyllodes tumors compared with the general population. We speculate that this may at least partially explain our larger numbers, as the surrounding population served by our institution has a high percentage of Latin Americans.

In our series of patients, core needle biopsy was found to have a 93% negative predictive value in the diagnosis of phyllodes tumors. All patients with core needle biopsy histologic findings favoring fibroadenoma underwent excision with narrow margins. Only 2 of 23 patients in whom core needle biopsy favored the diagnosis of fibroadenoma were determined to have phyllodes tumors at the final pathological analysis. Furthermore, both phyllodes tumors were histologically benign and were small lesions at 1.0 and 1.4 cm in diameter.

The positive predictive value of core needle biopsy was 83%. The 4 patients with a core needle biopsy diagnosis of phyllodes tumor that was eventually diagnosed as fibroadenoma after excision were reviewed. All specimens were believed to be phyllodes tumor based on a leaf-like pattern in the epithelial component of the core biopsy. After final excision, however, the specimens did not demonstrate this histologic finding, and they were subsequently classified as cellular fibroadenoma. The size of these lesions and age of the patients were not significantly different from the median values for the rest of the patients.

Although the positive predictive value was not as high as we would prefer for a perfect diagnostic study, combined with the negative predictive value of the test, this method can simplify management and reduce the number of unnecessary operations. The median age of the patient groups in our series was similar at 42 and 43 years. This was somewhat surprising, as the age at diagnosis of phyllodes tumor was expected to be older than that of fibroadenoma. This finding further emphasizes the need for a good pre-

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**COMMENT**

Phyllodes tumor remains an uncommon disease of the breast. It was originally termed cystosarcoma because of its cystic components and fleshy appearance. Phyllodes was added because of its papillary or leaflike protrusions of stromal connective tissue lined with epithelium, often extending into the cystic areas. Microscopically, it is composed of an epithelial element and a connective tissue stroma.

With increased public awareness and screening for diseases of the breast, most of the tumors are being discovered as small palpable masses or radiographically detectable abnormalities. This was evident in our series, as the median size was 1.1 cm and the largest tumor was 1.4 cm. After discovery, particularly in the case of a palpable breast mass, patients undergo routine assessment. As in other fields of surgery, the approach has become more selective or conservative. In premenopausal women, many breast surgeons use the “triple test,” the combination of physical examination, radiographic assessment (ultrasonography or mammography), and tissue specimen analysis (fine-needle aspiration or core needle biopsy) to assess their patients.

Traditionally, because of their large size at initial presentation, phyllodes tumors were managed with wide excision or mastectomy, particularly when malignant. Because of the trend toward diagnosis of these tumors at smaller sizes, phyllodes tumor no longer distinguishes itself based on size. The question then arises as to the proper technique for differentiating these lesions from other benign masses, particularly fibroadenoma. Fibroadenoma and small phyllodes tumor present similar findings on physical examination and during surgical excision. Most of these clinically similar lesions are therefore treated as fibroadenoma and enucleated for a better cosmetic outcome. Although enucleation is acceptable management for fibroadenoma, phyllodes tumor requires excision with clear margins. As a result, once the final pathological analysis was determined to be phyllodes tumor, most of these patients required a second operation to obtain clear margins. Without reexcision, the recurrence rates can be as high as 43%, necessitating a third operation.©2003 American Medical Association. All rights reserved.
operative diagnostic tool, as assumptions cannot be made based on the age of the patient.

Core needle biopsy allows those with a diagnosis of phyllodes tumors to undergo wide excision at an initial operation and minimize the risk of recurrence and re-operation. One series demonstrated a 55% accuracy for intraoperative frozen section analysis, indicating that initial core needle biopsy is a better test.\(^{11}\) Although up to 17% of patients in our study may have had unnecessary wide excisions, this is an improvement over the past, when a much higher percentage required reoperation for treatment of the inadequate margins. Furthermore, as these lesions are being detected at smaller sizes, the morbidity of a wide excision is significantly less than in the past, when giant tumors were frequently encountered. Perhaps the greatest benefit, because of the negative predictive value of 93%, is that most patients who have a core biopsy favoring fibroadenoma can avoid surgery and be managed with close follow-up.

The final diagnostic group comprised those with lesions for which the pathologist was unable to make a clear definitive distinction between fibroadenoma and phyllodes tumor. This happened in 16% (9/57) of the core needle biopsies. Of these, 5 were fibroadenoma and 4 were phyllodes tumor on final pathological analysis. Therefore, in these patients, we would recommend excisional biopsy, as the final pathological analysis was nearly an even split between the 2 diagnoses. This is further evidence of the accuracy of the test, as the equivocal lesions probably required substantial tissue to make the definitive differentiation between the 2 diagnoses.

In conclusion, core needle biopsy can significantly reduce the need for operative management of fibroepithelial lesions of the breast. A core needle biopsy favoring fibroadenoma should allow the breast physician to treat the lesion as a fibroadenoma, with observation and close follow-up or with enucleation. Core needle histologic analysis of phyllodes tumor allows the physician to preoperatively plan the definitive management at one surgical procedure, reducing the need for reoperations.

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REFERENCES