Rebiopsy after Stereotactic Core-needle Breast Biopsy: Prospective Study

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ABSTRACT

Objective: To review the indications for rebiopsy and subsequent pathology after stereotactic percutaneous core biopsy of breast lesions.

Patients and Methods: Stereotactic, 14-Gauge, core-needle biopsy was performed on 242 non-palpable breast lesions in 240 consecutive patients from 1 January 2001 to 31 December 2002. The patients were followed up for 7 months to 2 years.

Results: Of the 242 breast lesions, 22 (9.1%) lesions required rebiopsy. Of these 22 cases, 14 (64%) were initially diagnosed to be atypical ductal hyperplasia; at rebiopsy, 6 were actually ductal carcinoma in situ. For 4 (18%), findings from mammographic and pathological examinations differed; 2 cases subsequently showed ductal carcinoma in situ. Two (9%) lesions underwent rebiopsy because of insufficient biopsy material; the final diagnosis for both was also ductal carcinoma in situ. For 1 (5%) lesion, the pathological diagnosis was upgraded from atypical lobular hyperplasia to lobular carcinoma in situ. For 1 (5%) lesion, mammography after the first biopsy showed an increased extent of calcification, although both biopsies showed fibrocystic change. Wire-guided excisional rebiopsy was performed in 18 (82%) cases; the remainder were stereotactic vacuum-assisted rebiopsies. Rebiopsy showed 11 (50%) upgrades of histological diagnosis and 10 (45%) cases of malignancy.

Conclusions: Patients should be informed of the possibility of rebiopsy, and radiologists or surgeons should initiate a rebiopsy if histological and mammographic findings disagree; if a lesion is heterogeneous or a papillary lesion, radial scar, or possible phylloides tumour; or if material is insufficient for a pathological diagnosis to be made.

Key Words: Biopsy, needle; Breast neoplasms/pathology; Stereotaxic techniques

INTRODUCTION

Since the first published report of the technique by Parker et al in 1990, stereotactic core-needle breast biopsy has become the main method of establishing a histological diagnosis of mammographically detected breast lesions. The procedure not only is less invasive and less costly than surgical excisional biopsy, but it also yields results that have a high concordance rate (about 87% to 96%) when compared with the results of stereotactic 14-Gauge automated core biopsy and surgery; the best results are obtained by using a long-excursion biopsy gun and by performing the procedure on a prone table.

It has been stressed, however, that the pathological result obtained from percutaneous core-needle biopsy should be interpreted with caution and correlated with imaging and clinical findings, because certain samples obtained at core biopsy are intrinsically heterogeneous and an associated malignancy may not have been sampled. As a result, a repeat biopsy — either surgical excisional biopsy or directional vacuum-assisted biopsy — is required to arrive at a definitive diagnosis.

The objectives of this study were to investigate the factors affecting the need for the performance of a repeat biopsy after stereotactic percutaneous core biopsy of a
breast lesion, to review the final diagnoses, and to recommend indications for rebiopsy.

PATIENTS AND METHODS
A prospective study was conducted from 1 January 2001 to 31 December 2002 at Kwong Wah Hospital. All patients who underwent stereotactic, large core–needle biopsy for non-palpable breast lesions in the Department of Radiology were recruited into the study. During the 2-year study period, core-needle biopsies were performed on a total of 242 lesions in 240 consecutive patients, whose ages ranged from 38 to 72 years (mean, 56 years).

Core-needle biopsies were performed using a 14-G, long-throw (22-mm excursion) automated biopsy needle and gun (ProMag 2.2; Manan Medical Systems, Northbrook, IL, United States [US]), a dedicated stereotactic biopsy prone table, and a digital imaging unit (Lorad, Danbury, CT, US). For each lesion, 5 to 10 core samples were obtained and radiographs were taken to confirm successful biopsy of calcified areas.

Results of the histological examination were discussed in weekly meetings, which were held jointly between radiologists and breast surgeons. The radiologists commented on the technical aspects of obtaining the biopsy specimen, the quality of the core samples obtained, and the level of confidence in obtaining the most suspicious part of the lesion. The pathological findings were then compared with the mammographic and clinical findings to determine whether the results were all concordant. A joint decision about further treatment of the patient was made by the radiologists and the surgeons.

All patients were followed up for 7 months to 2 years to assess whether a repeat biopsy was needed. Repeat biopsies, if performed, were either surgical excisional biopsies or percutaneous stereotactic 11-G vacuum-assisted biopsies (performed on a Mammotome machine; Ethicon Endo-Surgery, Cincinnati, OH, US).

The indications for rebiopsy and the corresponding pathological findings were analysed.

RESULTS
Of the 242 breast lesions that underwent stereotactic core biopsy, 22 (9.1%) in a total of 22 patients showed various indications for rebiopsy. Among these cases, rebiopsy showed 11 (50%) upgrades of histological diagnosis; malignancy was detected in 10 (45%) cases (Table 1).

In all, 18 (82%) repeat procedures were performed using wire-guided excisional biopsy and 6 (18%) were performed using stereotactic vacuum-assisted biopsy. The choice of method depended on the morphology and distribution of the calcification, technical feasibility, pathological findings of the first biopsy, and patient preference.

The majority of the 22 lesions that required a second biopsy (n=14, 64%) did so because a pathological diagnosis of atypical ductal hyperplasia (ADH) was obtained at the initial core biopsy; mammography showed amorphous calcification (Figure 1). Because ADH is known to have a 5-time increased risk of coexisting malignancy,6 rebiopsy was performed for these patients to exclude malignancy. Six of these 14 lesions indeed showed coexisting ductal carcinoma in situ (DCIS) at the second biopsy. Hence, the rate of underestimation at the initial core biopsy was 43% for diagnoses of ADH.

In 4 (18%) of the 22 lesions, rebiopsy was performed because the original histological results were inconsistent with those from mammography. For these 4 lesions, the specimen obtained at the initial stereotactic core biopsy revealed either benign disease or no clinically significant disease. However, after review of the mammograms, 2 lesions displayed suspicious calcification, 1 displayed amorphous calcification, and 1 mass lesion had a lobulated contour. After

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**Table 1. Indications for rebiopsy and subsequent pathology.**

<table>
<thead>
<tr>
<th>Indication</th>
<th>Lesions, n = 22</th>
<th>Rebiopsy pathology (No. of cases)</th>
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<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>Malignant</td>
</tr>
<tr>
<td>ADH</td>
<td>14 (64)</td>
<td>DCIS (6)</td>
</tr>
<tr>
<td>Mammographic-pathological discordance</td>
<td>4 (18)</td>
<td>DCIS (2)</td>
</tr>
<tr>
<td>Insufficient tissue for pathological diagnosis</td>
<td>2 (9)</td>
<td>DCIS (2)</td>
</tr>
<tr>
<td>ALH</td>
<td>1 (5)</td>
<td>na</td>
</tr>
<tr>
<td>FCC in initial biopsy; increased microcalcification</td>
<td>1 (5)</td>
<td>na</td>
</tr>
</tbody>
</table>

Abbreviations: ADH = atypical ductal hyperplasia; DCIS = ductal carcinoma in situ; FCC = fibrocystic change; ALH = atypical lobular hyperplasia; LCIS = lobular carcinoma in situ; na = not applicable.
Rebiopsy after Stereotactic Core-needle Breast Biopsy

Two (9%) of the 22 lesions underwent rebiopsy because the initial core biopsy specimen provided insufficient material for pathological assessment. After a review of the technique in obtaining the specimen and the quality of the core samples, a repeat biopsy using wire-guided surgical excision was performed. Final diagnoses were DCIS in both cases.

One (5%) of the 22 lesions underwent rebiopsy because atypical lobular hyperplasia was diagnosed at the initial biopsy. The second biopsy showed lobular carcinoma in situ, which has a 30% lifetime risk of developing into invasive carcinoma in either breast.

Finally, 1 (5%) lesion underwent rebiopsy because the follow-up mammogram showed an increased extent of calcification despite the initial biopsy finding of only fibrocystic change. The findings of the second biopsy were again consistent with fibrocystic change.

**DISCUSSION**

The objective of stereotactic core biopsy of breast lesions is not to diagnose the breast disease on the basis of histology alone, but rather, to obtain a histological...
relation with imaging findings is important, because the
based solely on the results from the core biopsy. Cor-
Secondly, the diagnosis of breast lesions should not be
after repeat biopsy had yielded inadequate tissue at the
10 lesions for which malignancies were identified
mammographic findings. The following principles
results might at first imply that stereotactic core biopsy
of breast lesion per se is an inaccurate procedure; hence,
In our study, 9.1% of the 242 breast lesions required
of these, 11 (50%) had subsequent upgrades of histological
diagnosis and 10 (45%) were malignant. Although these
results might at first imply that stereotactic core biopsy
of breast lesion per se is an inaccurate procedure, it has
to be stressed that the value of stereotactic core biopsy
has been confirmed. The fact that the detection rate of
malignancy was high after repeat biopsy reinforces not
only the importance of rebiopsy, but also the role of
careful interpretation of the histological results obtained
from stereotactic core biopsy and their correlation with
mammographic findings. The following principles
should thus be borne in mind.

Firstly, if the core sample obtained is not adequate for a
opathological assessment, because of poor sample
quality or because of technical difficulty in obtaining a
proper or representative specimen, it is obvious that
rebiopsy is necessary. In the series of 70 patients
reported by Dronkers, for example, 2 of the 6 cases of
breast cancer were not diagnosed after initial stereoto-
tactic core biopsy because the samples did not contain
enough tissue for adequate diagnosis. In our study, 2 of
the 10 lesions for which malignancies were identified
after repeat biopsy had yielded inadequate tissue at the
initial stereotactic core biopsy.

Secondly, the diagnosis of breast lesions should not be
based solely on the results from the core biopsy. Cor-
relation with imaging findings is important, because the
lesion in question might not have been sampled properly.
In our study, 2 of the 10 lesions for which malignancies
were identified after rebiopsy were retested because the
findings from the first biopsy were discordant with those
from mammography. Dershaw et al reported that 27%
of patients who required rebiopsy did so because of
discordant imaging and histopathological findings; 47%
of that subgroup of patients had malignancy diagnosed
after rebiopsy. Thus, rebiopsy is necessary in cases of
mammographic-pathological discordance.

Thirdly, certain non-malignant histological findings
from core biopsy are heterogeneous in nature and are
associated with carcinoma. The nature of these lesions
demands additional and widened tissue sampling to al-
low a definitive pathological diagnosis to be made. Be-
ing the most common disease in this category, ADH is
frequently underdiagnosed by core biopsy or vacuum-
assisted biopsy. Lesions in patients with ADH have been
defined qualitatively as having some but not all the fea-
tures of DCIS, and they have been defined quantitatively
as having all the features of DCIS but involving only 1
duct, or as having all the features of DCIS but measur-
ing less than 2 mm. Hence, it is possible that a small
sample of a DCIS lesion may be misinterpreted by
the pathologist as ADH. Several authors have suggested
that a core biopsy finding of ADH should be followed
by surgical excision. Directional vacuum-assisted
biopsy diminishes but does not eliminate the problem
of ‘histologic underestimation’. Of lesions yielding a
diagnosis of ADH after directional vacuum-assisted
biopsy, roughly 38% are diagnosed as carcinoma at
surgery. Of the 14 patients in our study who received
a histological diagnosis of ADH after stereotactic core
biopsy, 43% (6/14) were found to have DCIS after
repeat surgical excisional biopsy.

Some benign pathological entities are associated with a
coexisting tumour, and some are difficult to distinguish
from a malignant lesion during stereotactic core biopsy.
Thus, if percutaneous biopsies yield these entities, a
second biopsy is recommended. For example, radial scar
has been reported to coexist with tubular carcinoma
and to possibly develop into it. Other lesions for which
repeat biopsies are generally recommended include pap-
illary lesions, possible phylloides tumour, atypical
lobular hyperplasia or lobular carcinoma in situ, and
(rarely) cavernous haemangioma or angiosarcoma.

The implications of our study are 2-fold. Firstly, pa-
tients need to understand before stereotactic core biopsy
Table 2. Indications and reasons for repeat biopsy after stereotactic core-needle breast biopsy.

<table>
<thead>
<tr>
<th>Indication</th>
<th>Reason</th>
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<tbody>
<tr>
<td>Insufficient sample for pathological diagnosis</td>
<td>Poor sample quality, technical difficulty in obtaining representative specimen, patient movement</td>
</tr>
<tr>
<td>Mammographic-pathological discordance</td>
<td>The mammographic lesion may not have been adequately sampled</td>
</tr>
<tr>
<td>Heterogeneous lesion on core biopsy</td>
<td>Examples are atypical ductal hyperplasia, radial scar, papillary lesion, possible phyllodes tumour, atypical lobular hyperplasia, lobular carcinoma in situ, and cavernous haemangioma or angiosarcoma</td>
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</tbody>
</table>

— preferably when giving consent for the procedure — that the biopsy result may not be definitive, and that about 9% of cases may require additional biopsy procedures to be performed. Secondly, a joint meeting between radiologists and surgeons is very useful for discussing all the biopsy results in relation to mammographic and clinical findings. These professionals should not hesitate to recommend and arrange a second biopsy procedure if it is indicated from the initial stereotactic core biopsy results. Recommendations for when to repeat the biopsy are shown in Table 2.

CONCLUSION

Stereotactic core biopsy is a useful and accurate method of obtaining histological information on mammographically detected breast lesions. A repeat biopsy that provides a larger tissue sample than the initial biopsy is occasionally required; 9.1% of the lesions in our study required such re-examination. The necessity for rebiopsy is emphasised by the presence of malignancy in 45% of lesions retested in our study. Patients should appreciate the need for repeat biopsy, and radiologists and surgeons should recommend a second biopsy when percutaneous core biopsy yields insufficient material for a pathological diagnosis to be established, when there is a discordance in mammographic and pathological results, or when the initial pathological report shows a heterogeneous lesion that requires a larger tissue sample for a definitive diagnosis to be made.

REFERENCES