

Original Article

Stereotaxic Fine-Needle Aspiration Cytologic Evaluation of Non-palpable Breast Lesions

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ABSTRACT

Background: Although long-term mammography is the standard means of evaluation for the probably benign lesions of breast, some times we feel obliged to know about the benignity and the extent of lesions earlier. Therefore we evaluated the diagnostic value of stereotaxic fine-needle aspiration (SFNA) in low suspicion breast lesions as an alternative to the routine modality.

Methods: The study included 150 low-suspicion or probably benign breast lesions detected on mammography. All cases underwent SFNA and followed by excisional biopsy or follow-up mammography based on SFNA findings.

Results: Fibroadenoma and normal tissue lesions were diagnosed in 57% of patients, in whom no evidence of malignancy was found in the follow-up period. In 48 patients with cytologic findings suggestive of proliferative fibrocystic disease, three cases of malignancy were detected by excisional biopsy.

Conclusion: A SFNA result suggesting benignity allows safe clinical follow-up, whereas a suspicious or equivocal diagnosis needs more invasive modalities for further investigations.

Key words: Breast, Mammography, Stereotaxic, Fine-Needle Aspiration (FNA)

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Mammography has been successfully used for early detection of non-palpable lesions in human breast^{1, 2}. Despite advances in mammographic technique, it remains difficult to absolutely predict the benign or malignant nature of mammographically detected breast lesions; so other diagnostic modalities are often required.

Low specificity of mammography in prediction of malignancy results in the widespread use of costly methods such as biopsies and short-interval mammographies, while most of these lesions are histopathologically benign³⁻⁵. The high number of lesions detected in mammography calls for simple as well as more reliable diagnostic procedures.

Stereotaxic Fine-Needle Aspiration (SFNA) has shown encouraging results in differential diagnosis of subclinical cancer⁶⁻⁹. In this study

we evaluated the results of SFNA in non-palpable, probably benign and very low suspicion lesions detected in mammography. If acceptable accuracy is obtained, this technique can be substituted for other routine methods.

Materials & Methods

Study population

From May 2001 to November 2003, we collected data of already performed SFNA during a period of 3 years before that with cytologic analysis on the samples of 150 consecutive patients with non-palpable breast lesions. Lesions were mammographically interpreted as probably benign or very low-suspicion for malignancy. Patients with medium or high-suspicion of malignancy on mammography

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were directly referred to be investigated with excisional biopsy, and were not included in the study.

SFNA procedure and cytologic analysis

Stereotaxic biopsies were performed using a General Electric stereotaxic upright mammography system (GE600T). Aspiration biopsies were performed using 23-gauge needles under stereomammographic guidance. The material was smeared directly onto a labelled glass slide and fixed in ethanol 95%. At least 10 slides were prepared for each patient. Giemsa staining was used for cytological assessment.

The specimens from SFNA were interpreted by an experienced cytopathologist. The results of SFNA were categorized as proliferative fibrocystic changes, fibroadenoma and normal tissue lesion.

Follow-up protocol

Patients with insufficient tissue samples were advised to repeat SFNA. The patients with reported proliferative fibrocystic changes in their breast tissue were referred to undergo excisional biopsy. All cases with fibroadenoma were followed by annual mammography for 30 months on average. The patients with normal tissue reports on SFNA were divided in two groups according to the presence or absence of risk factors for breast cancer. The patients with risk factors were advised to undergo excisional biopsy too, others were followed with serial mammography in six month-intervals for 30 months on average.

Data were analyzed on a computer using SPSS version 11 statistical package.

Results

Of the 150 cases, samples of 15(10%) patients were not adequate for cytological assessment. They were advised to have their SFNA repeated. Of these, two patients underwent repeated SFNA, and the remaining 13 were excluded.

A specific cytopathologic diagnosis was reported for all 137 cases including proliferative fibrocystic disease (n=58), fibroadenoma (n=67), and normal tissue lesion (n=12).

In those with reported proliferative fibrocystic disease, 10 cases refused to have excisional biopsy. In the remaining 48 cases, 3 malignant, 32 benign and 13 normal tissue lesions were reported. Two latter reports (benign and normal tissue) were verified by annual mammography. The diagnosis of fibroadenoma was made in 67 cases and was confirmed by routine annual mammography.

The results of SFNA in 12 cases showed normal tissue lesions including 4 cases having risk factors and the remaining 8 without specific risk factors for breast cancer. Biopsy in patients with risk factors showed 3 benign and 1 normal tissue lesions. Also short-interval mammography verified the diagnosis of normal tissue lesion in the remaining 8 cases.

The mean (\pm SD) age in the studied group was 49 ± 11 years (ranging from 31 to 72 years). All patients with malignant lesions were older than 60 years. The mean age of cases with fibroadenoma was 42 ± 8 years. More than 50% of them were younger than 40 years.

Discussion

The widespread use of screening mammography leads to the detection of increasing number of non-palpable lesions which need further investigation to rule in or out cancer. Complete assurance of benignity on the basis of a single radiologic appearance is usually not possible and needs long-term follow-up mammographies¹. On the other hand, subjecting all these non-palpable lesions to surgery seems unwise.

Currently, some protocols such as follow-up mammography, SFNA and core-needle or excisional biopsy⁷⁻¹² have been suggested for following lesions detected in mammography. Follow-up mammography is able to provide absolute assurance on the benignity of non-palpable probably benign lesions (category 3) but sometimes we need to know the exact pathology earlier, such as in cases of contralateral breast cancer, in anxious patients, pregnancy or when the patient decides to have breast augmentation or reduction¹³. In case of very low-suspicion lesions (category IV low

threshold), we need to confirm the benignity or malignancy of the lesions with the least invasive, easily available and also effective methods combined with cytopathological assessment. For these reasons, SFNA with cytologic analysis has emerged as an alternative or complementary tool in the management of non-palpable, probably benign or very low-suspicion breast lesions.

A study on 2444 cases with average follow-up of 2.7 years showed that the sensitivity of guided FNA (ultrasonic or mammographic) was 96.7%¹⁴. In this study surgical biopsy of all cases, to avoid diagnostic delays, possibly increased the benign biopsy rate by a factor of 4.5, with a rise in the benign/malignant biopsy ratio from 0.44:1 to 1.93:1.

It was reported that Ultrasound-guided and mammography guided FNA provided similar diagnostic accuracies¹⁵. The false negative rate of ultrasound-guided FNA in different studies was reported between 0 and 3.7%¹⁶⁻¹⁹. It is suggested that benign FNA diagnoses must be correlated with the clinical and imaging findings and in noncorrelative cases the patient should undergo biopsy¹⁶.

It is predictable that when results of FNA are correlated with imaging modalities, deciding on the need for biopsy becomes easier and more accurate. In a study on 426 women with non-palpable breast lesions, the false negative rate of combined imaging and FNA was 0%²⁰. In our series, all cases with SFNA findings suggestive of fibroadenoma or normal tissue lesions were followed carefully and no malignancy was detected in the study period. These results besides findings of previous reports^{7-10, 20-22} confirmed the high negative predictive value (NPV) of SFNA. In our cases the benignity of most lesions was confirmed based on follow-up mammographies. Although these cases were followed for 30 months on average, the possibility of missing potential false negative results was not completely eliminated.

In 48 of the 58 patients with proliferative fibrocystic disease on SFNA, excisional biopsy was performed and 3 malignant lesions were detected. Benignity of other lesions was confirmed by follow-up mammography. In summary, these findings suggested that we could rely on benign results of SFNA but in cases of atypia and non-diagnostic results, complementary techniques such as correlation with mammographic findings, follow-up or surgical biopsies are required. This conclusion is in accordance with previous studies^{20, 21}

Insufficient sample in the first try in this study was 10%, which was less than in most previous reports^{10, 11, 23-26}. The adequacy of the sample varies according to operator's experience¹¹. This observation stressed on the need for proper training to optimize the results. An important note is that whereas sampling and assessment are best done by a cytopathologist, an experienced radiologist can also reliably evaluate SFNA specimen adequacy. This suggestion has also been proposed in some previous studies^{9, 11}.

Surgical biopsy of all minor lesions found in mammography may be regarded as an exceedingly aggressive policy, on the other hand, core-needle biopsy is not easily available in Iran. Moreover, as mentioned earlier, we sometimes need to confirm benignity of a probably benign lesion before long-term mammography follow-up. We believe that SFNA with cytologic analysis can be of diagnostic value in the management of mammographically very low-suspicion and probably benign lesions especially if cytologic findings confirm benignity rather than exclude malignancy.

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