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# Fine needle aspiration cytology in the assessment of breast lumps in Ibadan

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## Summary

Within the period August 1984 to January 1987, 209 needle aspirates of breast lumps were examined cytologically. One hundred and forty-four smears had histological confirmation.

The diagnostic accuracy of fine needle aspiration cytology for malignancy is 79% in this study, with a specificity of 97%. The role of fine needle aspiration cytology, as a useful diagnostic tool and a necessary adjunct to clinical examination in the assessment of breast lumps is discussed.

## Résumé

Pendant la période d'août 1984 à janvier 1987, 209 patients desquels les grosseurs dans leurs seins ont été aspirés par voie d'aiguilles, étaient examinés cytologiquement. Cent-quarante-quatre des frottis avaient des confirmations histologiques.

L'exactitude diagnostique de la cytologie par aspiration à aiguille fine pour malignité est 79% dans cette étude, avec une précision de 97%. Le rôle de la cytologie par aspiration à aiguille fine comme outil diagnostique utile et auxiliaire nécessaire à la vérification clinique, dans l'évaluation des grosseurs du sein est discuté.

## Introduction

Clinical examination is the only non-invasive technique routinely available to the clinician in the assessment of breast lumps, where facilities for mammography are not available or the procedure is not routinely used. However, both

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techniques, either alone or in combination, cannot identify all malignant breast lesions, so every breast lump has to be biopsied for definitive diagnosis prior to further assessment and management.

In the University College Hospital (UCH), Ibadan, as in most centres throughout Nigeria, inadequate theatre facilities, limited operating time, and heavy patient load, all culminate in a long waiting list for operative procedures. This is without regard to whether the lump or mass is benign or malignant.

Fine needle aspiration cytology (FNAC), as a mode of definitive diagnosis of malignant breast masses, is well established in most of Europe, in particular in the Scandinavian countries [1-3]. Fine needle aspiration is a simple, well tolerated procedure that can easily be carried out in any out-patient clinic. The role of FNAC, as a useful diagnostic tool, and adjunct to clinical examination and mammography, is well demonstrated [4-6].

The aim of this study was to evaluate the accuracy of FNAC examination in Ibadan, and its usefulness in early assessment and further management of breast lumps.

## Materials and methods

Two hundred and nine fine needle aspirates of breast lumps from 188 patients were examined by the pathologists at the Pathology Department, UCH, over a 2½ year period. The aspirates were taken mainly by a Consultant Surgeon (ROS) and surgical registrars. All specimens were submitted with the patient's name, age, and hospital number, and were examined without knowledge of the clinical assessment.

Most of the fine needle aspirations were

carried out at the surgical out-patients clinic using a sterile 21 or 22-gauge needle and a 10 ml disposable plastic syringe. No prior local anaesthetic was given. Aspirated material was placed on standard microscope slides, thinly smeared and air dried. The smears were then stained with May-Grunwald Giemsa (MGG). The smears were read and categorized into: (1) benign (including fibroadenomas, fibrocystic disease, fat necrosis and other inflammatory conditions), (2) malignant, (3) suspicious, and (4) unsatisfactory for cytological diagnosis.

The histological sections of cases that had excisional biopsy and/or mastectomy later, were reviewed to correlate the findings and diagnoses with the cytological interpretations. Subsequent management of patients was based on the tissue histological diagnosis and not on the cytological results.

#### Assessment of accuracy

The final histopathological diagnoses of the biopsies or mastectomy specimens were compared with the cytological diagnosis of each smear. The sensitivity and the specificity of the technique were then calculated. The sensitivity was regarded as the proportion of cases with breast carcinoma that had a positive test, while specificity was the proportion of cases with benign disease that had a negative result [6]. A positive test was one considered cytologically to be malignant or suspicious.

#### Results

Of the 209 aspirates examined 100 were interpreted as cytologically benign, 43 as definitely malignant and 10 as suspicious (Table 1). A

Table 1. Classification of the 209 fine needle aspirates

Cytological diagnosis	Number of smears	Percentage
Benign	100	47.8
Malignant	43	20.6
Suspicious	10	4.8
Unsatisfactory	56	26.8
Total	209	100.00

significant proportion of smears (56) were unsatisfactory for diagnosis either because the cells were too scanty, bloody, and non-representative or the processing technique was unsuitable.

One hundred and forty-four aspirates had tissue histological diagnosis available; 86 were confirmed as benign and 58 diagnosed as malignant. Of the 86 histologically confirmed as benign, 65 smears were correctly diagnosed by cytology, 19 were unsatisfactory, one was malignant and one was suspicious (Table 2). The only false positive showed benign phyllodes tumour with stromal hypercellularity and atypia when examined histologically.

In six cases with cytological interpretations of benign, the lumps resolved completely at review prior to biopsy. These were clinically classified as cysts (5) and abscess (1). These cases were not included in Table 2.

Forty smears were interpreted correctly by cytology, out of the 58 that later proved to be malignant on histological examination. Six smears interpreted as suspicious were later confirmed as malignant, whilst 10 unsatisfactory smears proved to be malignant. Two smears were wrongly diagnosed as benign (Table 2).

One of the two false-negatives had focal lobular carcinoma *in situ*, as inflammatory (benign) was assumed to have been taken from a necrotic area, not representative of the lesion.

The sensitivity of fine needle aspiration cytology in this study was 79% with a specificity of 97%.

Table 2. Comparison of cytological and histological diagnoses of 144 fine needle aspirates

Cytological diagnosis	Histological diagnosis	
	Benign (n = 86)	Malignant (n = 58)
Benign	65	2
Malignant	1	40
Suspicious	1	6
Unsatisfactory	19	10

\*Sensitivity in per cent.

## Discussion

Several reports have attested to the usefulness of aspiration cytology in the diagnosis and management of breast masses [1-8]. When suitable aspiration is obtained, the diagnostic accuracy of fine needle aspiration is significantly higher than clinical examination and mammography [6,9]. One of the major advantages of the procedure is that it can give a definitive diagnosis of malignancy in over 90% of affected patients [6].

Furthermore, previous reports show that the accuracy with which a malignancy has been diagnosed by FNAC ranges between 66% and 99% [6,10], and in many, an accuracy of diagnosis >90% was recorded [1,7,9]. The 79% accuracy with which malignancy is diagnosed during our initial experience, compares favourably with the results recorded in the literature. However, this can be improved further with a decrease in the number of unsatisfactory smears.

The problem of false positivity, a worrying aspect of this technique, has occurred in other examinations, with a range of 0.1-1.8% cited in a recent review [8]. This, as in the present study, has been related to initial use of the technique, when experience is still being gained [1,10]. The issue of false positivity is not, however, unique to FNAC and has been recorded with frozen section [11,12] and Trucut-needle biopsy [13]. A significant reduction in false positive rate is expected with increasing experience and expertise.

The lowest rates of false negative results are recorded in Scandinavia where the greatest experience with the technique is found [8]. Even in the most experienced centres, 10% of cancers have a false negative cytology [5]. These are often due to failed aspiration in fibrotic lesions and to sampling error [2,10], since small lesions are likely to be missed by the needle. Kline *et al.* [10] found that false negatives were higher with infiltrating lobular carcinomas, 37% of which had false negative reports, compared to 8% of invasive ductal carcinomas. This is probably related to the degree of fibrosis in the former. However, the 7.4% false negatives reported in this study, compares favourably with the 3.6-17% range in the literature [8].

A significant proportion of the smears

(26.8%) in this series were found to be unsatisfactory for diagnosis, therefore reducing the possible diagnostic accuracy of the procedure. In the series by Furnival *et al.* [15], 59 smears (24.8%) from 237 lesions were unsatisfactory, while Smallwood *et al.* [5] had 117 (24.4%) unsatisfactory smears from 480 aspirates. Furnival *et al.* [14] attributed the high number of unsatisfactory smears to errors in the technique, and Dixon *et al.* [15] have demonstrated a significant reduction in the number of unsatisfactory smears, and increased accuracy of diagnosis of 59-99%, when the number of aspirators was reduced to one. Even though this is an initial experience with the technique, the 26.8% unsatisfactory smears in this series do not differ significantly from other reports.

A higher occurrence of unsatisfactory smears was also noticed amongst benign breast lumps [5,9]. Smallwood *et al.* [5] had 75 (36%) unsatisfactory smears from 240 benign lesions, a percentage similar to that observed here.

It is likely that with increasing experience, care with the aspiration, and a reduction in the number of aspirators, the number of unsatisfactory smears will be reduced and the degree of accuracy of diagnosis increased.

The advantages of FNAC are enormous, but the technique is under-utilized in most centres in Nigeria. Within a limited period, more fine needle aspiration biopsies than surgical biopsies can be done. As shown in this study, within the 2½ year period 209 aspirates were taken compared to 135 surgical biopsies.

Complementing clinical examination and mammography where available, fine needle aspiration biopsy will aid early diagnosis of breast cancer and help to sort benign from malignant lesions. This will certainly accord priority of admission for biopsy to urgent cases, and help reduce inappropriate bed occupancy. In addition to saving time and money, it will in time eliminate the two-stage procedure of excisional biopsy and later mastectomy. Patients can also be well counselled and advised before surgery, thereby reducing their anxiety.

This simple procedure requires minimal equipment and the techniques can easily be acquired. With a dedicated team, the use of fine needle aspiration biopsy can help improve the management of breast lumps in Nigeria.

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