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VALUE OF FINE NEEDLE ASPIRATION BIOPSY IN PREOPERATIVE DIAGNOSIS OF PALPABLE BREAST LUMPS IN RESOURCE-POOR COUNTRIES: A NIGERIAN EXPERIENCE

[1]A. Z. Mohammed, [2]S. T. Edino, [1]O. Ochicha, [2]S. U. Alhassan

Departments of [1]Pathology and [2]Surgery, Bayero University, Kano, Nigeria
Reprint requests to: Dr. A.Z. Mohammed, Department of Pathology, Aminu Kano Teaching Hospital, P. M. B. 3452, Kano, Nigeria. E-Mail: aminuzm@yahoo.com

Key words
Fine needle aspiration biopsy, palpable breast lumps

Abstract

***Background*:** Fine needle aspiration biopsy (FNAB) has been established as a quick simple and accurate means of diagnosing breast lesions and offers a financially attractive alternative to open surgical biopsy. This study was undertaken to assess the value of FNAB in the evaluation of breast lumps at Aminu Kano Teaching Hospital, a major referral center in Kano, Northern Nigeria over a 2-year period (2001-2002).

Methods: A retrospective evaluation of 157 patients who had FNAB, of which 93 had histological confirmation.

Results: Of the 61 histologically confirmed benign lesions, 57 had been interpreted as benign cytologically, while 1 and 3 cases respectively were reported as atypical and unsatisfactory. There were 32 histologically confirmed malignant cases, 27 of which had been reported as malignant on FNAB, 2 as suspicious and 3 as benign. The positive predictive value was 100% with a sensitivity of 90.6% and specificity of 100%.

Conclusion: The high diagnostic accuracy obtained in this study warrants FNAB to be utilized as a first line diagnostic procedure in the evaluation of patients with palpable breast lesions in developing countries.

Mots clés
la Belle biopsie d'aspiration d'aiguille, les tas de sein tangibles

Résumé

Fond: la Belle biopsie d'aspiration d'aiguille (BPAA) a été établi comme un moyen rapide, simple et précis de diagnostiquer les lésions de sein et elle offre une alternative financièrement attrayante pour la biopsie chirurgicale ouverte. Cette étude a été entreprise d'évaluer la valeur de BPAA dans l'évaluation de tas de sein à l'Hôpital d'enseignement Aminu Kano, un centre de référence majeur à Kano, au nord du Nigéria pendant une période de 2 ans (2001-2002).

Méthode*:* Une évaluation rétrospective de 157 malades qui avaient BPAA, dont 93 avaient la confirmation histologique

Résultats*: Parmi* les 61 lésions bénignes histologiquement confirmées, 57 avaient été interprétés comme bénignes cytologiquement, tandis que 1 et 3 cas ont été respectivement rapportés comme atypique et insatisfaisant. Il y avait 32 cas malins histologiquement confirmés, dont 27 avaient été rapporté comme malin sur BPAA, 2 comme suspects et 3 comme bénignes. La valeur prédictive positive était 100% avec une sensibilité de 90,6% et spécificité de 100%.

Conclusion*:* La haute précision diagnostique obtenue dans cette étude permet à BPAA d'être utilisée comme une première ligne de procédure diagnostique dans l'évaluation de malades avec les lésions de sein tangibles dans les pays en voie de développement.

Introduction

Diseases of the breast constitute a significant proportion of surgical cases seen in both developed and developing countries, and frequently, the need arises to distinguish benign from malignant lesions prior to definitive treatment. To achieve this, a multidisciplinary team approach in the assesment of patients is required as recommended in the triple test.[1] In developing countries and countries with limited resources, mammography is not available in most centres so one is left with the options of clinical breast examination and pathological diagnosis following biopsy. [2]

Although open surgical biopsy is the 'gold standard' for diagnosis of palpable breast lesions (PBL), in recent years two types of minimally invasive breast biopsy techniques; core needle biopsy (CNB) and fine needle aspiration biopsy (FNAB) have become established for the diagnostic evaluation of palpable breast lesions. [3, 4]

FNAB is a simple and relatively less traumatic procedure, which provides a good method for obtaining samples from breast lesions. It has the advantage of being accurate and rapid with the possibility of same day results for patients. [5]

In developing countries and countries with Limited resources, majority of breast cancers are advanced and an unequivocal preoperative diagnosis of malignancy is frequently desired by clinicians in order to justify a more intense medical evaluation for metastatic disease and to institute preoperative adjuvant therapy. In such settings, FNAB serves as a cost-effective alternative to open surgical biopsy. [6]

This study assesses the efficacy of FNAB in preoperative diagnosis of palpable breast lesions at Aminu Kano Teaching Hospital, Kano, Northern Nigeria.

Patients and Methods

All patients who had FNAB of clinically palpable breast lumps at the cytology clinic of Aminu Kano Teaching Hospital, Kano, Nigeria with subsequent histological confirmation over a 2-year period (2001 – 2002) were included in the study.

The FNAB Specimens were taken by pathologists using freehand with a 21G disposable needle attached to a 10ml or 20 ml disposable plastic syringe. Aspirated material were smeared on standard microscope glass slides and one set fixed immediately in 95% alcohol and stained with routine Haematoxylin and Eosin stains. Another set were air dried and stained with May-Grunwald-Giemsa stains. Following cytological assessment, smears were categorized into unsatisfactory, benign (negative), equivocal (atypia), suspicious and malignant (positive) groups. Histology slides of the cases were reviewed following excision biopsy or mastectomy and compared with cytology results for correlation.

Data on results of FNAB and histology were then used to calculate sensitivity, specificity, predictive values, true and false positive rates based on the NHS BSP guidelines. [7] Sensitivity was regarded as the proportion of breast cancer cases with a positive or suspicious result, while specificity is the proportion of cases with benign breast lumps that had a negative result. The positive predictive value was considered as the number of breast cancer cases with positive results. False positive rate is the number of cases with benign lumps with a positive result, and false negative rate the proportion of breast cancer cases with a negative result.

Results

A total of 157 FNAB of PBL were done during the period, out of which 93 (59.2%) had histological confirmation. Table 1 shows the distribution of all 157 FNAB results. Of the 93 cases with histological diagnosis, 61 (65.6 %) and 32 (34.4%) were found to be benign and malignant respectively. Table 2 shows the cytological diagnosis with histopathological correlation. Fifty-seven of the histologically confirmed benign lesions had been correctly interpreted as such on cytology, 1 as equivocal and 3 as unsatisfactory. There was no false positive case recorded.

Analysis of the 32 histologically confirmed malignant cases shows that 27 were reported to be malignant by cytology, while 3 and 2 cases respectively were interpreted as benign and suspicious. The false negative rate was 5%. The sensitivity of FNAB was 90.6% with specificity of 100%. The positive predictive value was 100%.

Table 1: Classification of 157 fine needle aspirates

Cytological diagnosis	No. (%)
Benign	112 (71.3)
Malignant	38 (24.2)
Suspicious	2 (1.3)
Atypia	2 (1.3)
Unsatisfactory	3 (1.9)
Total	157 (100)

Table 2:Correlation of cytological and histological diagnosis of 93 fine needle aspirates

Cytological diagnosis	Histological diagnosis	
	Benign (n = 61)	Malignant (n = 32)
Benign	57	3
Malignant	-	27
Suspicious	-	2
Atypia	1	-
Unsatisfactory	3	-

Sensitivity: 90.6%; Positive predictive value: 100%
Specificity: 100%; False positive rate: 0%
False negative rate: 5%

Discussion

FNAB has been determined to be a highly accurate tool in the preoperative diagnosis of palpable breast lesions in this study. Obtaining a preoperative diagnosis is desirable when dealing with breast cancer as it gives the patient a chance to come to terms with a diagnosis of cancer prior to Surgery and allows discussion of treatment options in order to progress to a therapeutic rather than a diagnostic operation. [1,7] It also reduces the benign surgical biopsy rate avoiding unnecessary surgery in women with benign lesions especially in areas where resources are limited. [7]

International Studies have demonstrated good correlation between FNAB and histology results. [8] The sensitivity of 90.6% and specificity of 100% obtained in our study conforms to sensitivity of 79-99% and specificity of 60–100% reported in various series. [4,5,9-12] However these figures need to be interpreted with caution, as comparison of series is often difficult due to various complicating factors such as different case mix (palpable vs. impalpable), the inclusion of atypia/suspicious results as positive and the exclusion of inadequate results when calculating FNAB sensitivity. [1]

FNAB specificity and sensitivity is also technique dependent, better results being obtained with free hand aspiration as performed in this study when compared to stereotactic FNAB. [13] Our findings indicate that unsatisfactory smears were infrequent because all FNAB were performed by Pathologists who ensure specimen adequacy at the time of collection. Masood has advocated on effectively utilizing the talent and expertise of pathologists around the globe in order to better serve patients particularly medically underserved women and those living in countries with Limited resources. [14] Nigerian studies on FNAB also document higher specificity and sensitivity in centers with onsite cytopathologists in comparison to centers where clinicians served as the aspirators mainly attributable to high rates of unsatisfactory smears. [15,8] A reduction in number of unsatisfactory smears can be achieved by reducing the numbers of aspirators. The role of the aspirator aside, lesions less than 2cm in size and benign lesions such as fibroadenoma have been shown to pose particular problems with FNAB diagnosis. [9,16,17]

Inadequate specimens may require multidisciplinary review of clinical and mammographic findings to determine if repeat FNAB, core needle biopsy or excision biopsy is required, as has been successfully applied in the triple test. [18,19] At our center where mammography is not available, image guided FNAB using ultrasound is likely to increase diagnostic cost and pose a limitation to the procedure. Therefore in areas under economic restrictions, repeat FNAB will be the cost-effective option to complement clinical breast examination.

Both cases with suspicious FNAB results were found to have breast malignancy following biopsy. This emphasizes the need for further evaluation of suspicious lesions, which often prove to be malignant.[4] Excision biopsy for the single case with FNAB diagnosis of atypia turned out to be a fibroadenoma and it is well recognised that atypia in FNAB is commonly seen with fibroadenoma.[9]

The 100% positive predictive value in this study means that a FNAB diagnosis of malignancy justifies definitive treatment as no false positive diagnosis was made. Furthermore, it may be a more acceptable diagnostic tool to surgical biopsy because many of our patients have the belief that surgical biopsy causes dissemination of breast cancer. Additionally, in situations such as ours where surgical facilities are also limited, FNAB can assist in the triage of patients with breast lumps so that priority can be given to those with malignancy.

Sampling error however remains a possibility with benign results in view of the 5% false negative rate recorded in this study. Reasons for false negative results include failed aspiration, fibrotic lesions, invasive lobular carcinoma and other uncommon histological variants of breast cancer. [8,20, 21] An interesting case of malignant fibrous histiocytoma with extensive necrosis posed a significant diagnostic challenge accounting for one false negative diagnosis.

In conclusion, we recommend that FNAB be utilised as a first line diagnostic procedure in patients presenting with palpable breast lesions especially in developing countries and countries with limited resources. When diagnostic accuracy has been determined to be high in a centre, definitive treatment can be offered to patients with cancer, and in those with benign results, excision should be performed only at the patient's request.

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