

Original Research Article

The Role of FNAC in the Management of Breast Diseases in Abakaliki, South-East Nigeria

U.E. Eni¹, F. Iyare², I. Sunday-Adeoye³, M.E. Isikhuemen³, K.C. Ekwedigwe³, M.O. Eliboh³

¹Department of Surgery, ²Department of Pathology,
Federal Teaching Hospital, Abakaliki, Nigeria.

³National Obstetric Fistula Centre, Abakaliki, Nigeria.

Corresponding Author: M.E. Isikhuemen; Email: maradona4real2002@yahoo.com

ABSTRACT

Background: Breast lesions are common presentations to the surgeon. However, their effective diagnosis and management depends on the specialist skills of many disciplines. Presently the triple assessment regimen is the recommended approach for the investigation of palpable or impalpable lesions detected by imaging. Fine needle aspiration cytology (FNAC) is frequently part of our initial assessment of breast lesions as histology report takes much longer time to obtain in our practice.

The aim of this study was to document the effectiveness of FNAC in our practice of triple assessment regimen in the management of breast diseases.

Methods: This was a 30-month prospective analysis of 329 patients seen at our breast clinic at the National Obstetric and Fistula Centre, Abakaliki between June 2013 and December 2015. This was done under the auspices of an intervention study including free FNAC when indicated.

Results: The FNAC report included 250(76%) negative for malignancy (benign), 64 (19.5%) positive for malignancy and 15 (4.6%) suspicious for malignancy. Of the 250 cases reported as benign at FNAC 10 cases were confirmed malignant at histology. All 64 cases that were positive for malignancy were concordant with histology. Out of the 15 cases reported as suspicious for malignancy 3 were benign on histology. FNAC had a sensitivity of 88.4% and a specificity of 98.8%. The positive predictive value was 96.2%; the negative predictive value was 96%. The diagnostic accuracy was 96.1%.

Conclusion: FNAC is highly sensitive and specific in the evaluation of breast lesions in our practice. This should lead to accurate diagnosis in the context of triple assessment in the majority of cases to permit definitive treatment.

Key words: Breast lesions, triple assessment regimen, FNAC, Abakaliki, South East Nigeria.

INTRODUCTION

Breast lesions are common presentations to the surgeon. However, their effective diagnosis and management depends on the specialist skills of many disciplines. Presently the triple assessment regimen is the recommended approach for the investigation of palpable and non-palpable lesions detected by imaging. This includes (1) Clinical breast examination, as well as essential history; (2) Imaging –

mammography or breast ultrasound scan; and (3) Non-excision biopsy-FNAC and or core biopsy. The triple test is positive if any of the three components is positive and negative if all the components are negative. [1]

The triple test has a sensitivity (true positive rate) of 99.6% and a specificity (true negative rate) of 62%. [2] FNAC is reported as reliable in the early pathological diagnosis of breast diseases with relatively

high sensitivity and specificity. [3-6] It reduces the need for open biopsy with its attendant cost, time and theatre space requirements. Accurate interpretation requires close working relationship between the surgeon, radiologist and pathologist. When a discrepancy between components of the triple test occur, further investigation is mandatory. This may include open excision biopsy or repeat FNAC under ultrasound guidance.

Within both screening and diagnostic setting, the triple test approach aims to ensure that most breast lesions are diagnosed without the need for excision biopsy, while maintaining a high accuracy for the detection of cancer. If the result of FNAC suggests malignancy, there is opportunity for pre-operative counseling of the woman regarding treatment options and this may assist in the planning of a single stage surgery. [7] If a benign diagnosis is reported or confirmed and where the need for excision biopsy is eliminated, the woman can be reassured and appropriate management options discussed.

A thorough clinical examination and necessary imaging investigation should be done prior to FNAC, whether palpable or non-palpable, as haematoma associated with sampling procedure compromise the interpretation of subsequent clinical examination or imaging studies.

Known advantages of FNAC over core needle biopsy include the fact that the sampling procedure is quicker, does not require local anaesthesia, it is less traumatic and associated with fewer complication rate. [8] Also the results are relatively quick (within a few hours) and it is relatively inexpensive. Disadvantages of FNAC compared to core biopsy include the fact that it requires expertise in preparation of quality smears and considerable cytology expertise to interpret FNAC. [4] FNAC cannot differentiate between ductal carcinoma in-situ and invasive carcinoma. [9,10] Also definitive diagnoses of some lesions are difficult to make on the basis of FNAC. [11] These conditions are atypical

ductal hyperplasia (ADH), low grade ductal carcinoma in-situ, some tubular carcinomas and some invasive lobular carcinomas. Potential complications of FNAC include displacement of the epithelium and the needle tract implantation.

The aim of this study was to document the effectiveness of FNAC in our practice of triple assessment test in the management of breast diseases.

METHODS

This was a 30-month prospective analysis of 329 patients seen in our breast clinic at the National Obstetric Fistula Centre, Abakaliki, Nigeria between June 2013 and December 2015. Apart from providing free surgical services to patients with urogenital fistula, the centre also runs a dedicated breast clinic for the management of breast diseases. Ethical approval was obtained from the hospitals ethical committee before commencement of the study. This study was done under the auspices of a pilot intervention study. This included public enlightenment undertaken at public places at different local government areas of the state and nearby towns of neighboring states. During the awareness campaigns undertaken at worship centres, schools and health centres in all the local governments of Ebonyi State and some nearby towns of neighboring states, the public were educated on self breast examination (SBE) signs of early and late breast cancer and they were encouraged to present early to hospital. Free clinical assessment was offered as an incentive to those who came. Initial clinical assessment of patients attending clinic includes detailed proforma based history and thorough physical examination as well as examination of any breast lesion. The patients were then investigated as appropriate including free FNAC test when indicated. The indications for FNAC were (1) investigation of significant palpable masses, irrespective of whether they were considered benign or malignant. (2) Investigation of impalpable image-detected masses that are considered

likely to be benign or with typically malignant features usually under ultrasound guidance. (3) Investigation of suspected local recurrence of breast cancer. (4) Evaluation of cystic lesions to rule out malignancy. Benefits and possible complications of the procedure were explained to the patient and consent was obtained before the procedure. Our practice of FNAC involves using a thin hypodermic needle (23G) and 10 ml syringe to extract cells or fluid from an abnormal area. Two smears were taken for each patient by the pathologist who also read all the slides following H and E stain. The histopathologic report of the specimens were later obtained following incision or excision biopsy and compared with the FNAC report. Data obtained was displayed in tables and analysed using the Statistical Package for Social Sciences version 21 and discussed.

RESULTS

Out of the 329 patients who had breast lump, 3 were males giving a male to female ratio of 1:109. Their age ranged from 18 to 79 years with a mean age of 34.63±13.86years. The highest frequency of breast lump was in the age group of 20 to 29 years (34.7%). This is shown in table 1.

Table 1: Age distribution of patients

Age	Frequency (%)
10-19	34 (10.3)
20-29	114 (34.7)
30-39	72 (21.9)
40-49	59 (17.9)
50-59	25 (7.6)
60-69	20 (6.1)
70 and above	5(1.5)
Total	329 (100)

FNAC was benign in 250 (75.99%), positive for malignancy in 64 (19.45%) and suspicious for malignancy in 15 (4.56%) patients as shown in table 2.

Of the total 250 lesions reported as benign at FNAC 10 cases were positive for malignancy at histology while 240 cases were confirmed benign (Table 3). All 64 cases that were positive for malignancy were concordant with histology while of the

15 cases reported as suspicious for malignancy, 3 were benign on histology and 12 cases confirmed as malignant.

Table 2: FNAC diagnosis of patients

FNAC diagnosis	Frequency (%)
Malignant	64 (19.5)
Suspicious	15 (4.6)
Fibroadenoma	106 (32.2)
Fibroadenosis	68 (20.7)
Duct ectasia	20 (6.1)
Mastitis	15 (4.6)
Lipoma	14 (4.3)
Breast abscess	7(2.1)
Galactocoele	4(1.2)
Breast cyst	4(1.2)
Duct papilloma	3(0.9)
Gynaecomastia	2 (0.6)
Phyllodes	2(0.6)
Fibrous tissue	3 (0.9)
Acellular debris	2 (0.6)
Total	329 (100)

Table 3: FNAC results versus histology

FNAC result	Histology		
	Positive	Negative	Total
Positive	76	3	79
Negative	10	240	250
Total	86	243	329

Calculations for validity tests:

Total number = 329

True positives = 76

False positive = 3

False negative = 10

True negatives = 240

$$\text{Sensitivity} = \frac{TP}{TP + FN} \times 100 = 88.37\%$$

$$\text{Specificity} = \frac{TN}{TN + FP} \times 100 = 98.77\%$$

Positive predictive value

$$= \frac{TP}{TP + FP} \times 100 = 96.2\%$$

Negative predictive value

$$= \frac{TN}{TN + FN} \times 100 = 96.1\%$$

False positive rate

$$= \frac{FP}{FP + TN} \times 100 = 1.23\%$$

False negative rate

$$= \frac{FN}{TP + FN} \times 100 = 11.63\%$$

Accuracy

$$= \frac{TP + TN}{\text{Total Number}} \times 100 = 96.1\%$$

FNAC in our study had a sensitivity and specificity of 88.4% and 98.8% respectively. The positive predictive value was 96.2 % while the negative predictive value was 96%. The diagnostic accuracy for FNAC was 96.1%.

DISCUSSION

In our study, FNAC was highly acceptable to our patients (100%) even when the procedure had to be repeated due to unsatisfactory smears. It also proved to be quite safe as none of our patients had any significant complication requiring treatment. These findings are similar to some previous reports. [4,8,12]

The mean age of our patients was 34.63±13.86 years. The age range of patients was between 18 and 79 years with a peak age range of 20 – 29 years (34.7%). These sociodemographic indices are similar to previous studies. [13-16] The peak age range for benign breast lesions was also 20 – 29 years (43.4%). This age distribution for benign breast lesions is similar to a previous study done in Abakaliki. [17] The peak age incidence for malignant breast lesions was 30-39 (33.3%) years in this study. The peak age range for malignant breast lesions was 10 years lower than that reported by Ogbuanya. [17] The younger age at presentation in this study may be accounted for by the wide spread breast cancer awareness created by this institution in the communities during the study. This low peak age incidence for breast cancer in our study is consistent with other reports that show that breast cancer occur in younger age group in black women when compared to the age distribution in Caucasian women. [18,19] Of the 329 patients with breast lumps, all but 3 were females giving a male to female ratio of 1 to 109.

Of all the patients under study, 243(73.9%) were benign at histology while 86(26.1%) were malignant. Breast lesions therefore remain predominantly benign. This is consistent with other reports. [20-25] Overall, fibroadenoma was the commonest

benign lesion (32.2%) followed by fibroadenosis (20.7%). This is consonant with some other studies. [14,20,23,25] However, a study done elsewhere have reported the predominance of fibroadenosis over fibroadenoma. [26] This may well be true in our practice as not all patients with breast nodularity of fibroadenosis had significant breast mass amenable to FNAC sampling and so were excluded in the study.

Of the 3 male patients with breast mass, two (67%) were benign (gynaecomastia), while one (33%) was malignant. There was a single case of male breast cancer. This is lower than figures reported for male breast cancer among black populations. [27] This may be attributed to the fact that females were the main target during the public breast cancer awareness campaign undertaken by this institution during the study. There is therefore need to regularly raise awareness even among men of their risk for breast cancer. This is more so as breast cancer in men is known to commonly present at advanced stage with poor prognosis.

Of the 64 cases that were reported as malignant on FNAC, all were confirmed as malignant breast cancer at histology. However, of the 15 cases that were reported as suspicious for malignancy at FNAC, 3(20%) turned out to be benign following excision biopsy and histology. Therefore mutilating breast surgeries such as mastectomy should not be carried out on the basis of unequivocal FNAC report of suspicious for malignancy especially for early disease.

Of the 250 cases reported as benign, 10(4%) were positive for malignancy at histology. Therefore all excision biopsy specimens should be subjected to histology even when FNAC done previously proved negative for malignant cells. Histologic diagnosis of malignancy is then followed up with appropriate treatment

In this study, FNAC had a sensitivity of 88.4% and specificity of 98.8%. Other studies have revealed a similar sensitivity ranging from 87.1% to 100% and specificity

between 87.5% and 100%. [5,6,8,13-15,20-24,9,28] The relatively high incidence of false negative report in this study (4%) suggests that a negative FNAC report should not be relied upon especially when any other component of the triple assessment is positive or suggestive of malignancy. Repeat FNAC preferably under ultrasound guidance or excision biopsy and histology should therefore be done without delay. The high specificity of 98.8% in this study is indicative of experience gained by our pathologists who have practiced FNAC over several years. Skill on FNAC reporting may improve with dedication and time (positive learning curve).

The positive predictive value of 96.2% and negative predictive value of 96% are both high. These figures are comparable to other reports of positive predictive value ranging from 90% to 100% and negative predictive value of 84% to 98.78%. [5,8,20-24]

The diagnostic accuracy of FNAC in the index study was equally high at 96.1% and comparable to figures between 87.3% and 100% previously documented by others. [5,6,8,20,21,24] Therefore in the context of triple assessment test including clinical evaluation and imaging report, FNAC is sufficiently accurate to make a diagnosis of a breast lesion to permit definitive treatment in our practice. This finding is particularly important in our setting as it will significantly reduce the waiting time for definitive treatment. This is because while FNAC result is obtained within 24 hours in our practice, other forms of pathologic diagnosis (core needle biopsy and excisional or incisional biopsy and histology) take much longer time, averaging 4 weeks.

CONCLUSION

Our study showed that FNAC is highly acceptable to our patients. It is cheap (offered free during this study) and the procedure is devoid of any serious complication. The high sensitivity, specificity and diagnostic accuracy that we reported showed that FNAC is a reliable method of early diagnosis of breast lesions

in our practice. We therefore recommend the popularization of FNAC in our practice to complement histological diagnosis of breast lesions for early and optimum treatment of our patients.

Declaration

Ethics approval and consent to participate: Ethical approval was obtained from the ethical committee of the National Obstetric Fistula Centre, Abakaliki, Nigeria. Patients that gave consent were those that participated in the study. Verbal consent was adequate for the study as suggested by the ethical committee. Even without the study FNAC is one of the initial investigations we routinely do for our patients with breast lump. Refusal to give consent did not influence management of the patient involved.

Consent for publication: not applicable.

Availability of data and materials: the corresponding author will make it available when requested.

Competing interests: None

Funding: None

Author's contributions: All authors participated in each section of this manuscript. All authors read and approved the final version of this manuscript.

Acknowledgement: None

REFERENCES

1. Nigam M, Nigam B. Tripple Assessment of Breast – Gold standard in Mass Screening for Breast Cancer Diagnosis. Journal of Dental and Medical Sciences 2013;7(3): 01 – 07
2. National Breast Cancer Centre. Evidence Related to Guidelines for the Investigation of Breast Symptoms. Second Edition. National Breast Cancer Centre, Camperdown, NSW, 2006.
3. Mitra S, Dey P. Fine needle aspiration and core biopsy in the diagnosis of breast lesions: A comparism and review of the literature. Cytojournal 2016; 13 : 18
4. Gong Y, Shetty MK Breast Cancer: Pathology, Cytology, and Core Needle Biopsy Methods for Diagnosis. Breast and Gynaecological cancers An Integrated Approach for Screening and

- Early Diagnosis in Developing Countries 2013; 19-37
5. Ahmed S, Raza SZ, Khan TM. To evaluate the accuracy of FNAC in palpable breast lumps at Breast Clinic of Abbasi Shaheed Hospital, Karachi. *Pak J Surg* 2010; 26 (2): 111 – 117.
 6. Pailoor K, Fernandes H, Jayaprakash CS, Marla NJ, Keshava MS. Fine Needle Aspiration Cytology of Male Breast Lesions – A Retrospective Study Over a Six Year Period. *Journal of Clinical and Diagnostic Research* 2014; 8 (10): 13-15.
 7. Ahmed ME, Ahmad I, Akhtar S. Ultrasound guided fine needle aspiration cytology versus core needle biopsy in the preoperative assessment of non-palpable breast lesions. *J Ayub Med Coll Abbottabad* 2010; 22(2): 138 – 142.
 8. Madubogwu CI, Ukah CO, Onyiaorah IV, anyiam DCD, Anyanwu SNC, Chianakwana GU. Cost effectiveness of fine needle aspiration cytology for breast masses. *Orient Journal of Medicine* 2015; 27(1-2): 22- 27.
 9. Challa VR, Guru BGY, Rangappa P, Deshmane V, Gayathri M. Cythological and pathological correlation of FNAC in assessing breast lumps and axillary lymph node swellings in a public sectoe hospital in India. *Pathology Research International* 2013. Article ID 695024.
 10. Tse GM, Tan PH. Diagnosing breast lesions by fine needle aspiration cytology or core biopsy: which is better? *Breast Cancer Res Treat* 2010; 123:1
 11. Sneige N, Staerkel GA. Fine needle aspiration cytology of ductal hyperplasia with and without atypia and ductal carcinoma in situ. *Hum Pathol* 1994; 25(5): 485 – 92
 12. Suen MWM, Chan MKM. The role of fine needle aspiration cytology in the diagnosis of breast lesions. *HKMJ* 1996; 2 (1): 62 – 67.
 13. Ghosh A, Ghartimagar D, Sathian B, Narasimhan R, Talwar OP. Fine needle aspiration cytology in breast lump – its cytological spectrum and statistical correlation with histopathology. *Indian Journal of Community Health* 2013; 25 (4): 451-459
 14. Tiwari M. Role of fine needle aspiration cytology in diagnosis of breast lumps. *Kathmandu University Medical Journal* 2007; 5(18): 215 – 217.
 15. Aslam S, Hameed S, Afzal T, Hussain A. Correlation of FNAC and histological diagnosis in the evaluation of breast lumps. *JUMDC* 2012; 3(2)
 16. Shah SAA, Pervez SN, Javed K. diagnostic performance of fine needle aspiration cytology (FNAC) in the diagnosis of breast lumps. *J Ayub Med Coll Abbottabad* 2013; 25(1-2): 46 – 48.
 17. Ogbuanya AU, Anyanwu SNC, Nwigwe CG, Iyare F. Clinicopathologic study of breast lumps in Abakaliki, South Eastern Nigeria. 2016. DOI: 10.3126/ajms.v7i3.13772
 18. Anyanwu SNC. Temporal trends in breast cancer presentation in the third World. *Journal of Experimental and Clinical Cancer Research* 2008; 27:17
 19. Ihekweba FN. Breast cancer in Nigerian women. *British Journal of Surgery* 1992; 79: 771 – 775.
 20. Khageshan AP, Wali S, Andola SK. Diagnostic utility of FNAC in the evaluation of breast masses. *International Journal of Recent Scientific Research* 2015; 6(8): 5827-5831.
 21. Jarwani PB, Patel DC, Patel SM, Dayal A. Fine Needle Aspiration Cytology in A palpable Breast Lump. *GCSMC J Med Sci* 2013; 2 (2): 12-16.
 22. Thakkar B, Parekh M, Trivedi NJ, Agnihotri AS, Mangar U. Role of fine needle aspiration cytology in palpable breast lesions and its correlation with histopathological diagnosis. *National Journal of Medical Research* 2014;4(4): 283-288.
 23. Mahajan NA, Bhale CP, Mulay SS. Fine Needle Aspiration Cytology of Breast Lesions and Correlation with Histopathology- A 2 Year Study. *International Journal of Health Sciences and Research* 2013; 3(2): 55-65
 24. Harsh K, Archana CB, Sukanya P, Shirish SC, Rohan J. Role of fine needle aspiration cytology as “one stop” diagnosis for assessment of breast lumps in women. *International Journal of Life Sciences and Pharmaceutical Research* 2016; 6(2): 9-13

25. Likhari KS, Fatima A, Hazari RA, Gupta SG, Shukla U. Diagnostic role of FNAC in breast lesions. *IJRRMS* 2013;3(1): 12 – 14.
26. Zghair LF, Eriby QH, Hasan JA. Breast mass management; an interventional study. *IJAR* 2016; 4(9): 934-939.
27. Ezeome ER, Emegaokor CD, Chianakwana GU, Anyanwu SNC. The pattern of male breast cancer in Eastern Nigeria. *Nmj* 2010; 51(1): 26 – 29.
28. Daramola AO, Odubanjo MO, Obiajulu FJ, Ikeri NZ, Banjo AAF. Correlation between Fine-Needle Aspiration Cytology for Palpable Breast Masses in a Nigerian Tertiary Health Institution. *International Journal of Breast Cancer* 2015. Article ID 742573.

How to cite this article: Eni UE, Iyare F, Sunday-Adeoye I et al. The role of FNAC in the management of breast diseases in Abakaliki, South-east Nigeria. *Int J Health Sci Res.* 2017; 7(6):17-23.
