



USE OF FINE NEEDLE ASPIRATION CYTOLOGY IN THE EVALUATION OF BREAST LUMPS

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ABSTRACT

Background: Breast cancer is the most common cancer in women worldwide. Fine needle aspiration cytology is a cost effective and easy procedure in the diagnosis of breast lump.

Methods: This was one-year prospective study between May 2019 and May 2020. Needle aspiration was done in 200 patients presenting with breast lump. Histopathology correlation was done in 99 cases.

Results: Fibroadenomas were most common lesions. Malignancy was reported in 66 cases. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were found to be 95.23%, 100%, 100%, 92.30% and 96.96% respectively.

Conclusions: Fine needle aspiration cytology is a simple, easy, OPD based, cost effective procedure with high sensitivity, specificity and accuracy in diagnosis of breast lumps.

KEYWORDS : Breast lump, malignant, Cytology, Fibroadenoma.

INTRODUCTION

Breast lumps is the most common presenting feature of breast diseases.^[1] They are mostly benign but malignancy contribute to significant percentage of breast lumps^[1] It is sometimes difficult to determine whether a suspicious lump is benign or malignant simply from clinical assessment, The International Academy of Cytology (IAC) developed system for Reporting Breast Fine-Needle Aspiration Cytology (FNAC) named as Yokohama System, by a group of cytopathologists, radiologists, surgeons and oncologists expert in the management of breast lesions (Triple test Comprise of clinical, imaging and fnac cytology) In **Yokohama System** for Reporting Breast Cytopathology, the "Breast Group" has proposed a five-category classification: category 1- insufficient material; category 2- benign; category 3- atypical, probably benign; category 4- suspicious for malignancy, probably in situ or invasive carcinoma; and category 5. Aims of the system is To standardize and improve the reporting of breast cytology Establish best practice guidelines Improve training in the performance and interpretation of breast cytology Clarify communication between cytopathologists and breast clinician and to link this reporting system with patient management to facilitate optimal breast care. Application of Yokohama System of reporting breast cytology aids in definitive diagnosis of patients who present with breast lumps at the outpatients clinic and offer the best possible treatment.^[3] A confident diagnosis can be made in 95% of the cases through a combination of clinical examination, imaging and FNAC.^[4] FNAC is a relatively simple, reliable, accepted and established method to determine breast lesion. The investigation of the pathological lesion by extraction of the cells through a fine bore needle for microscopic examination to arrive at a diagnostic decision is a useful and cost-effective technique.^[1] FNAC is widely used as reliable, rapid and cost-effective procedure and it is very well established as diagnostic modality for elucidating the etiology of breast lumps.^[1,2,3] The objective of the present study is use of Fine Needle Aspiration Cytology in The Evaluation of Breast Lumps^[3] Fine-needle aspiration cytology is the most reliable component of this triple test assessment of breast lesions due to its high sensitivity, specificity, negative predictive value, and positive predictive value.^[5]

MATERIAL AND METHOD

This study was carried out in a tertiary care hospital. This was a prospective study between May 2019 to May 2020. The study was approved by institution ethics committee. FNAC was performed after obtaining written consent in all the 200 patients. All the patients presenting with breast lump were included in the study. In procedure for FNAC fine needle aspiration was performed using 21- 23G needles attached to 10cc syringes. One to two "to and fro" movements were given and the aspirated material was smeared onto glass slides. Smears were fixed in 95% ethyl alcohol and stained with Papanicolaou and Haematoxylin and Eosin (H and E) stains.^[3] In cases where fluid was

aspirated on FNA, the fluid was centrifuged and smears were prepared from the sediment followed by the above staining methods. Criteria for adequacy in smear was at least six clusters of ductal cells on each smear comprising 10 cells per cluster.^[1]

Procedure for histopathology involved the biopsy specimens which were fixed in 10% formalin for 24 hours. Then gross examination was done in the department of pathology by consultant histopathologists.^[1,3] The gross and cut section findings were noted. Several bits were taken from appropriate sites for processing and paraffin embedding. From each block, sections were cut at 4-5 micron thickness and stained with H and E.^[1]

RESULTS

Total 200 FNACS were performed of breast lump during 1 year of study period. Out of which 196 were female cases and 02 were male cases and 02 cases performed were inadequate in material. Youngest patient was 16 years and oldest was 81 years. Table-1 showing no. of cases according to Yokohama grading system where inadequate C1 cases are 02, benign C2 cases are 105, atypical probably benign C3 cases are 17, suspicious for malignancy C4 cases are 10 and malignant C5 cases are 66. Aspiration for male breast lump was done in 02 cases. Aspirations in 02 cases were reported as unsatisfactory due to scanty cellularity. Hence, final study included 198 cases for statistical analysis. Benign lesions 130 were most common findings in which fibroadenoma was most common benign lesion 59 cases, followed by fibrocystic disease 29 cases, acute mastitis 21 cases, Acute suppurative mastitis and Non-TB granulomatous mastitis 05 cases each, chronic nonspecific mastitis 04 cases, galactocele 03 cases Fat necrosis and Benign cystic lesions 02 cases each. Malignancy was reported in cases 66 cases.

Table-1 category (yokohama Grading System)

Category	no. of cases
Inadequate [C1]	2
Benign [C2]	105
Atypical, probably benign [C3]	17
suspicious for malignancy [C4]	10
Malignancy [C5]	66
Total [CYTOLOGY]	200

Table-2 Gender Wise Distribution Of Breast Lump

	Category	No. of cases
Female	Inflammatory lesions	
	Acute suppurative mastitis	5
	Acute mastitis	21
	Non-TB granulomatous mastitis	5
	Chronic nonspecific mastitis	4

	Traumatic lesions	
	Fat necrosis	2
	Benign proliferative lesions	
	Fibrocystic disease	29
	Benign cystic lesions	2
	Benign lesions	
	Fibroadenoma	59
	Galactocele	3
	Malignant lesions	66
Male	gynecomastia	2
	Total	198

Table-3 Histopathological Correlation With Fnac

Cytological diagnosis	Histopathological diagnosis		
	Malignant	Benign	Total
Malignant	60(TP)	0(FP)	60
Benign	3(FN)	36(TN)	39
total	63	36	99

Gynecomastia was reported in 2 cases (Table 2). Only 99cases underwent surgical procedure and could be correlated with histopathological examination (Table 3). Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were calculated from Table 3 and were found to be 95.23%, 100%, 100%, 92.30% and 96.96% respectively.

- Sensitivity = $60/(60+3) = 95.23\%$
- Specificity = $60/(60+0) = 100\%$
- Positive predictive value = $60/(60+0) = 100\%$
- Negative predictive value = $36/(36+3) = 92.30\%$
- Accuracy = $36+60/(36+60+3) = 96.96\%$

DISCUSSION

Breast lump is very common presentation in surgery and gynecology outpatient department. Early diagnosis of carcinoma can reduce significant morbidity and mortality. FNAC of breast lumps is an important part of triple assessment (clinical examination, imaging, and FNAC) of palpable breast lumps. The application of FNAC for the diagnosis of palpable breast masses was first introduced by Martin and Ellis in 1930. FNAC is simple, cost effective and less traumatic as well as highly sensitive and specific method for assessment of breast lump.^[1,2]

In cytopathology, fibroadenoma smears are hypercellular with a relatively monomorphic population of ductal cells, some forming monolayered sheets along with numerous bipolar cells (myoepithelial cells) in the background. Some degree of atypia, nuclear enlargement, and cellular

Table:4 Comparison With Other Studies

	Panjvani S et ⁵ al ⁵	Modi P et al ¹¹	Present Study
Sensitivity	97.8%	94%	95.23%
Specificity	100%	98.5%	100%
Positive predictive value	100%	97%	100%
Negative predictive value	97.8%	97%	92.30%
Accuracy	98.9%	97%	96.96%

decohesion is often associated with the aspirates of fibroadenoma. The cases termed as "fibroadenoma with atypia," have the potential to be diagnosed as low-grade malignancies.

Atypia in the form of clusters or scattered epithelial cells with markedly enlarged nuclei containing visible and enlarged nucleoli was seen in 17 cases. Gynecomastia were reported in 2 cases and 2 were reported as unsatisfactory. Ductal epithelial cells arranged loosely in irregular sheets, reported as atypical. In current study, histopathological correlation with cytological diagnosis was done in 99 cases.

In current study, sensitivity, specificity, positive predictive value, negative predictive value and accuracy were found to be 95.23%, 100%, 100%, 92.30% and 96.96% respectively. This was very much like Panjvani S et al Modi P et al and Saraf S et al.^[11,5]

CONCLUSION

Breast lump is a common clinical presentation with wide differential diagnosis. Early diagnosis can significantly reduce the morbidity and mortality associated with malignancy. FNAC is a simple, easy, OPD based and cost effective procedure in diagnosis of breast lumps.

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