ORIGINAL RESEARCH PAPER

Pathology

ROLE OF FNAC IN THE DIAGNOSIS OF BREAST MASSES & ITS CORRELATION WITH HISTOPATHOLOGY

KEY WORDS: Breast, FNAC,

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ABSTRACT

Background- A very rapid tentative diagnosis can be done by FNAC with a cost effective and fairly accurate with excellent patient acceptance without any morbidity and mortality. Hence a quick treatment plan can be achieved without even biopsy in most of the cases.

Aim of the Study- To evaluate the accuracy % of FNAC as a diagnostic tool in the breast lumps after correlating it to the histopathological diagnosises.

Material & Methods- The present study was conducted in the histopathology department of the central laboratory FHMC hospital between September 2017 to September 2018. During this period 191 cases of breast lumps were evaluated by FNAC and 103 cases were subjected to histopathology correlation.

Result- FNAC of 103 benign and 38 malignant cases were studied. Fibroadenoma followed by fibrocytic disease were most common in benign breast lesions and invasive ductal carcinoma, NST was most common among malignant breast lesions. Cytohistological correlation was done in 103 cases 64 benign and 39 malignant of which one was found to be false negative. Accuracy was 99.02%. A detailed comparative analyses with other authors' study was also done.

Conclusion- FNAC plays a main role to provide rapid and accurate diagnosis in OPD itself so that definite management decisions can be made straightaway. Diagnostic errors with subsequent inappropriate clinical decisions can be best avoided if clinician use the Triple diagnostic procedure of clinical examination, mammography and FNAC which increase the accuracy for diagnosis of breast carcinomas.

I. Introduction

The FNAC'S advantage is to provide rapid accurate diagnosis. It is cost-effective with an excellent acceptance by patients causing minimal or no morbidity[6]. FNAC of breast have average sensitivity of 87% (range of 72.99%), specificity of 98-100%, negative predictive value of 87-99%, and the efficiency of 89-99%[7,8]. False positive rates in the literature are reported to approximately 4%[10]. The combination of palpation, mammography and FNAC (Triple test) has been found to considerably increase the diagnostic accuracy in the breast lesion [12]. Fine needle aspiration (FNA) biopsy of breast was first used in the 1930s by Martin & Ellis and by Stewart at Memorial Hospital [1,2], followed in the late 1940s and early 1950s by Adair & Godwin[3]. A palpable breast lump is a common diagnostic problem to both general practitioners and surgeons[4]. FNAC is a valuable tool and can be used to evaluate all palpable and nonpalpable mammographically evident breast lesions[5]. The present study is to evaluate the FNAC in different type of breast lumps and to compare the result with histopahological study in the available follow-up and assess the accuracy of FNAC of the breast.

II. Material & Methods

The present study was conducted in the histopathology department of the central laboratory of FHMC hospital from September 2017 to September 2018. During the study period, 191 FNAC were performed which includes 183 females and 8 males. FNA was carried out using 10cc syringe and 23 & or 24 gauge needle from proper site under manual guidance and aseptic precautions without local anesthesia. Smears were immediately wet fixed for Pap and H&E and air dried for Diff Quick and then stained.

Among 191 cases subjected to FNAC, 158 were followed for biopsy. In histolopathology, gross findings were noted and multiple serial sections were taken for processing, blocks made and 4-5µm thick sections were cut and stained with H&E stain. Selective cases were subjected to immunohistochemistry when required to confirm the diagnosis.

III. Observations & Result

Out of 181 cases subjected to FNAC, 141 were reported as benign breast lesions and 40 as carcinomas of breast. Among the 143 breast lesions, fibroadenomas account for 68 cases, 40 fibrocystic disease, 4 galactocele, 3 granulomatous lesion, 1 benign phyllodes, 5 ductal hyperplasia, 3 acute nonspecific mastitis, 2 fat necrosis, 1 epidermal cyst, 4 breast abscesses, 4 gynecomastia and benign breast lesions without a specific diagnosis in 6 cases. Hence 141 benign breast lesions were finalized. Among the 40 malignant breast lesions, ductal carcinomas accounted for 35 cases, 2 lobular carcinomas and 1 metaplastic carcinoma and one each of medullary, Mucinous Among these 118 Relevant neoplastic benign and 40 malignant lesions depicted in Tables 1, 2 and 3 as follows.

Table 1 Cytohistological correlation of benign lesion

	HISTOPATHOLOGY						
Cytology Fibroade	-noma	Fibrocystic Disease	Granulo-matous	Phyllodes Duct	papilloma	Gyneco-mastia	Total
Fibroadenoma 68 68							
Fibrocystic disease 40 40							
Granulomatous disease 3 3							
Benign phyllodes 1 1							
Other Benign lesion 1 1 2							
Gynecomastia 4 4							
Total 68 40 4 1 1 4 118							

Table 2 Cyto-histological correlation of malignant lesions HISTOPATHOLOGY

Cytology	Invassive Ductal Ca	Tubular Ca	Medullary Ca	Mucinous Ca	Lobular Ca	Tubulolobular Ca	Metaplastic Ca	Total
Ductal Ca	32	1	1	1				35
Lobular Ca					2			2
Metaplastic Ca	1						1	1
Total	33	1	1	1	2	1	1	40

Table 3 Cyto-histological correlation of all breast lesions

Histological diagnosis Total

Cytological diagnosis Benign breast lesions Malignant breast lesions

Benign breast lesions	118	118	
Malignant breast lesions	00	40	40
Total	118	40 1	58

Table 4 Analysis of results

True Positives (TP) 38
False Positives (FP) 00
True Negatives (TN) 64
False Negatives (FN) 1

***Table 5* Analysis of results**

Sensitivity = TP/ TP+FN *100 = 38/40X100 97.46 % Specificity = TN/ TN+FP*100 =64/64X100 100 % Positive Predictive Value = TP/ TP+FP*100 = 38/38X100 100 % Negative Predictive Value = TN/ TN+FP*100 = 64/64X100 100 % Accuracy Rate = TP+TN/ TP+TN+FP+FN*100 = 102/103X100 99.02 % False Positive Rate = FP/ FP+TN*100 = 0/64X100 0 % False Negative Rate = FN/ TP+TN*100 = 1/102X100 0.98%

IV. Discussion

In our study, age of patients varied from 8-85 years with male to female ratio was 1:23. The oldest case was diagnosed (85 years) as invasive ductal carcinoma, NST and the youngest (8 years) was juveline fibroadenoma. Similar age group was observed in other studies[10,11].

In the present study, fibroadenoma was the most commonly diagnosed entity in benign breast lesions. (N =68/118=57.6%) followed by fibrocystic disease (N =40/118=34%). In males, gynecomastia was the common lesion. This finding correlated with other authors[11,12,13,14].

Among malignant lesions, infiltrating ductal carcinoma was the most common, which correlated with many authors[11,12,13,14]. The incidence of benign lesions in the present study were similar to the observations made by Y. D. Choi et al[22], Rocha et al[24] and Ashwin et al[23] whereas the incidence of malignant cases were in comparison with the observation of Ishita Pant et al [12] as depicted in Table 6.

Comparative analyses of cytological diagnoses of benign and malignant breast lesions in our present study with studies done by other authors are tabulated in Table 7and Table 8.

The sensitivity of 98.46% in our present study is comparable to that obtained by Chavda[15](95.2%), Willis[16] (90%), Suen[17] (95%) and Ritu[18](96.5%) shown in Table 9.

In the present study, the positive predictive value was 100% with no false positive and false negative rate was 0.97 % which was comparable to Chavda J[15] (PPV=100%, FP=0, FN=1.5%) shown in Table 9. In the present study, there was no false positive giving specificity of 100% and positive predictive value of 100% which is comparable with Chavda J[15], Ritu[18], Silverman[6], Wollenberg[19], Barrow[20], Tiwari[21] shown in Table 9. Thus false positive diagnoses is relatively rare in breast FNA if the interpretation are made by experienced pathologists.

***Table 6* Comparative Analysis of Breast lesions**

Author Names	Rocha[24]	Ishita[12]	Y D Choi[22]	Ashwani[23]	Present Study
Year of study	(1997)	(2003)	(2004)	(2015)	(2018)
Breast Lesions					
Benign	641(76.58%)	85 (68%)	981 (75.64%)	319 (77.24%)	118 (74.6%)
Malignant	99 (11.83%)	25 (20%)	182 (14.03%)	76 (18.4%)	40 (22.1%)

Table 7 Comparative Analysis of Benign Breast lesions

Cytology Diagnosis	Sreenivas[25] (1989) 222 cases	Rocha[25] (1997) 837 cases	Pinto[11],(2004) 582 cases	Ashwin[23] (2015) 413 cases	Present study 181 cases
Fibroadenoma	69 31.08%	177 21.15%	166 28.52%	128 30.99%	68 57.6%
Fibrocystic disease		285 34.05%	23 3.95%	91 22.03%	40 34%
Galactocele	5 2.25%			14 3.4%	4 3.3%
Granulomatous	2 0.9%		2 0.34%	6 1.46%	3 2.5% %
Benign Phylloids			5 0.86%	3 0.73%	1 0.84%
Ductal Hyperplasia					4 3.3%
Nonspecific Mastitis				7 1.69%	3 2.5%
Fat Necrosis	1 0.45%			3 0.73%	2 1.65%
Breast Abscess	17 7.66%	58 6.93%	12 2.06%	27 6.54%	3 2.57%
Microfalaria	3 1.35%			1 0.24%	1 1.65%
Epidermal Cyst				7 1.69%	1 1.65%
Gynecomastia	1 0.45%	26 3.11%	13 2.24%	9 2.18%	4 3.3%
Benign Breast Tr				6 1.45%	7 6.0%
Duct Ectasia				3 0.73%	
Acessory Breast				12 2.9%	
Duct Papilloma				2 0.48%	
Intramammary lymph Nodes				1 0.24%	
Total	98 44.14%	546 65.24%	221 37.96%	319 77.24%	141 78%

Table 8 Comparative Analysis of Malignant Breast lesions

Cytological Diagnosis	Ishita Pant[12] (2003) N = 125	Pinto[11] (2004) N = 582	Ashwin[23] (2015) N = 413	Present study N = 191
IDC, NST	20 16%	167 28.69%	69 16.71%	35 17.54%
Tubular Ca				1 0.26%
Medullary				1 0.26%
Mucinous	2 1.6%	3 0.52%	3 0.73%	1 0.26%
Classical lobular		1 0.17%	1 0.24 %	2 0.56%
Tubulolobular				1 0.26%
Metaplastic				1 0.52%
Paget's	2 1.6%		1 0.24%	
Inflammatory Ca	1 0.8%			
Recurrent Ca			2 0.48%	
Total	25 20%	171 29.38%	76 18.40%	54 20.16%

Table 9 Comparative Analysis of Breast lesions by different authors

Study	No of FNAC	Sensitivity	Specificity	PPV	NPV	Accuracy %
Silvermann[8] (1989)	80	96	100	100	98	99
Sampat[28] (1997)	1120	96	100	100	89.50	97
Rocha[22] (1997)	837	93.8	98.21	92.70		97.40
Y D Choi[22] (2004)	1297	77.7	99.2	98.4	88	91.1

Pinto[11,] (2004)	1582	97.8	100	100	98.6	99.1
Ashwin[23,] (2015)	413	96.97	100	100	98.63	99.05
Present study	191	97.46	100	100	100	99.02

V. Conclusion

Our present study concludes that FNAC of breast is valuable diagnostic tool and plays one of the main roles providing a rapid and highly accurate diagnosis in OPD itself so that a definite management strategy can be formulated on the spot. FNAC enables us to differentiate benign from malignant lesions with high sensitivity, specificity and diagnostic accuracy. Diagnostic errors leading to subsequent inappropriate clinical decisions can be best avoided if clinicians use the Triple diagnostic procedure of clinical examination, mammography and FNAC which increase the accuracy for diagnosis of malignancies of breast.

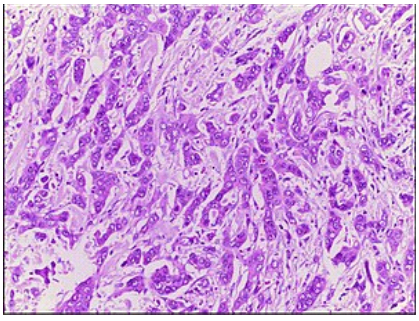

Figure-1-Invassive Ductal Carcinoma

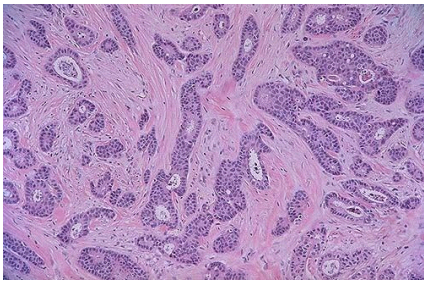

Figure-2-Invassive Ductal Carcinoma

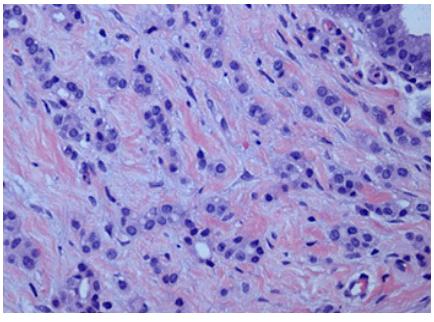

Figure-3-Invassive Lobular Carcinoma

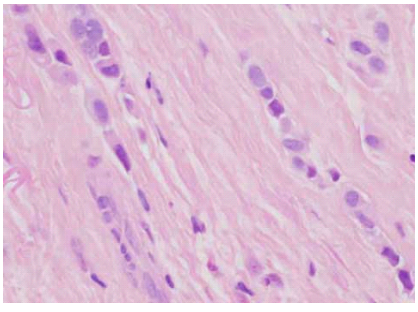

Figure-4-Iniltrating Lobular Carcinoma

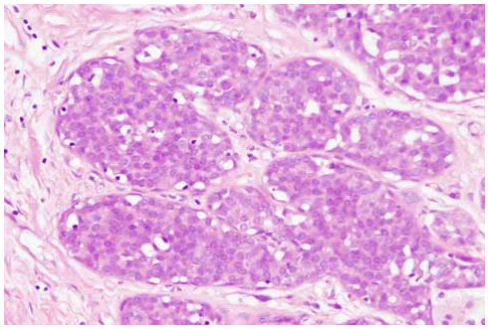

Figure-5-DCIS-Ductal Cell Carcinoma in Situ.

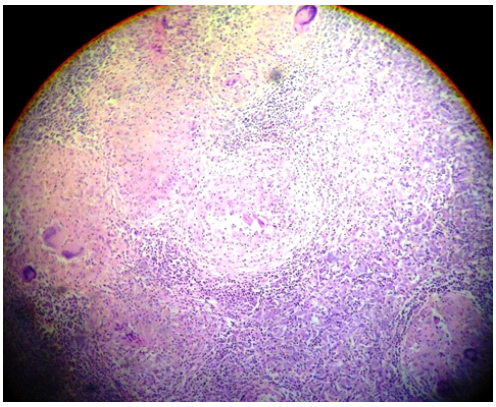

Figure 6 Granulomatous Mastitis

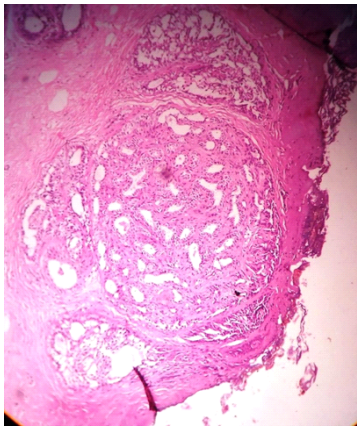

Figure-7- Atypical Ductal Hyperplasia

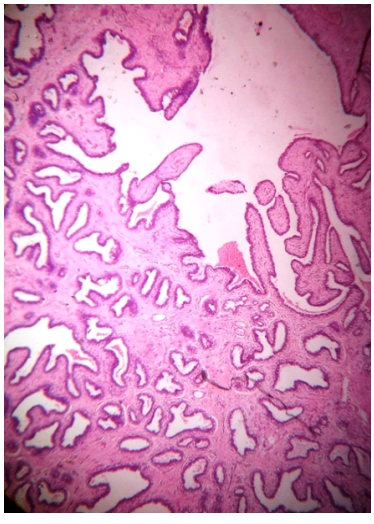

Figure-8-Ductal Papilloma in Breast

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