Histo-cytopathological Correlation Of Breast Lesions- A Study Of 100 Cases

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Abstract

Background: Breast diseases are showing rising trend world-wide. Fine Needle Aspiration Cytology (FNAC) is a simple, minimally invasive, cost effective, outpatient based and a rapid diagnostic method for breast lesions. A definitive treatment plan can be prepared with the use of FNAC.

Materials and Methods: This study was carried out at Department of Pathology, at B.J Medical College and Civil Hospital, Ahmedabad over a period of 2 years from December 2019 to Dec 2021. A total of 100 breast aspirates were studied. Smears were stained with Haematoxyline and Eosin (H&E), Papanicolaou (PAP) and May-Grunwald Giemsa (MGG) stains.

Results: Among 100 patients, 93 were females and 7 were males. Benign breast lesions were found in 72 cases (72%); among which fibroadenoma was the commonest lesion (28%). Malignant lesion was observed in 23 cases (23%); among them, ductal carcinoma was the predominant lesion (22%). Out of 100 cases of breast lesions, histo-cytopathological correlation were possible in 66 cases. Histopathological confirmations were obtained in 64 cases out of 66 cases. Sensitivity and specificity of FNAC in breast lesions were reported to be 92.5% and 100% respectively, with 100% positive predictive value and 95.1% negative predictive value. Diagnostic accuracy of FNAC in the present study was found to be 96.9%.

Conclusion: FNAC of breast lesions correlate very well with histopathological examination of excisional breast biopsies. In experienced hands, they are extremely useful in evaluation of breast lesions.

Introduction

A palpable breast lump is a common diagnostic problem to both general practitioners and surgeons. The main purpose of the fine needle aspiration cytology (FNAC) of breast lump is to confirm cancer pre-operatively and to avoid surgery in specific benign conditions.

Fine Needle Aspiration Cytology (FNAC) is a simple, minimally invasive, cost effective, outpatient based and a rapid diagnostic method for breast lesions. A definitive treatment plan can be prepared with the use of FNAC [1,2].

Breast carcinoma is the most common cancer in women worldwide accounting for 25% of all cancers. Rate of breast carcinoma is high as 25.8 per 100,000 women and mortality is 12.7 per 100,000 women [3,4].

The aims of this study were to correlate the cytological findings with histopathological examinations for breast lesions and to determine the accuracy of FNAC in the diagnosis of breast lesions. Many countries have breast cancer screening programs aimed at detecting early disease in asymptomatic women. The diagnostic process involves the "Triple test" consisting of clinical examination, mammography and FNAC [5,6].

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Out of the various grading systems, Robinson's grading system is simple and time saving and hence we have selected it to be correlated with Modified Bloom Richardson's grading by cytological and histopathological examination of tissue and histo-cytopathological correlation [7,8].

However, the aspiration cytology is not a substitute for conventional surgical histopathology as a definitive diagnosis is not always possible by cytology, but categorization of disease and differential diagnosis can be provided in the majority of cases. With this in mind, an attempt was made to evaluate the breast lesions in FNAC material and to compare it with histopathological study [9,10].

Materials And Methods:

A retrospective study was carried out at B.J Medical College and Civil Hospital, Ahmedabad over a period of 2 years from December 2019 to Dec 2021.Fine Needle Aspiration Cytology was carried out on total 100 patients with breast lesions; among which cyto-histopathological correlations were obtained in 66 cases.

After taking detailed history and informed consent, the aspiration was done by using 10 ml syringe with 23 G needle following through a clinical examination. Smears were stained with Haematoxyline and Eosin (H&E), Papanicolaou and May-Grunwald Giemsa (MGG) stains. Histo-cytopathological correlation was done. Statistical analysis of results were performed.

Inclusion criteria includes all the patients with palpable breast lump who gives consent for FNAC.

Exclusion criteria includes all the patients with palpable breast lump, who does not give consent for FNAC and also who have received any modality of preoperative chemo/radio therapy were excluded from the study.

Results:

The age of the patients varied from 16 to 75 years in the present study. Out of 100 cases, female and male were 93 and 7 respectively.

TABLE 1: Age and sex wise distribution of total 100 patients with breast lesions.

Parameters	No. of cases
(A) Sex: Female	93
Male	07
B) Age: <20	03 (03%)
21-30	40 (40%)
31-40	36 (36%)
41-50	15 (15%)
60-75	06 (06%)

TABLE 2: Cytological diagnosis of breast lesion by FNAC (n=100)

Category	Cytological Diagnosis	No. of cases	Percentage
Inflammatory Lesions (23 cases-23%)	Acute Mastitis/Abscess	08	08%
	Granulomatous Mastitis	12	12%
	Fat necrosis	03	03%

Benign Breast Lesions (49 cases-49%)	Fibroadenoma	28	28%
	Fibrocystic disease	14	14%
	Galactocele	04	04%
	Gynecomastia	03	03%
Lesions Not Recognized As Benign or Malignant (02 cases-02%)	Phyllodes tumor	01	01%
	Papillary lesion	01	01%
Atypical/Indeterminate- Probably Benign (01 cases-01%)	Epithelial hyperplasia with atypia	01	01%
Suspicious of Malignancy (02 cases-02%)	Atypical cells suspicious of Malignancy	02	02%
Malignancy (23 cases-23%)	Ductal Carcinoma	22	22%
	Mucinous Carcinoma	01	01%
Total		100	100%

Out of 100 cases benign breast lesions were the most common lesions in young females, among which the fibroadenoma was the commonest one (28%). The malignant lesions were common in fourth and fifth decades of life, among which infiltrating ductal carcinoma was the most common lesion (23%).

TABLE 3: Histo- Cytopathological Correlation (n=66)

FNAC	Histopathological Diagnosis						
	Inflammatory Lesion	Fibroadenoma	Fibrocystic Disease	Phyllodes tumor	Papillary lesion	Ductal carcinoma in situ	Breast Carcinoma
Inflammatory lesion	10						
Fibroadenoma		26					
Fibrocystic disease			3				
Phyllodes tumor				1			
Papillary					1		

lesion									
Suspicious for malignancy								2	
Breast Carcinoma									23

TABLE 4: Histo-cytopathological correlation, statistical evaluation of breast lesions and comparison with other studies

Studies	Cytological diagnosis	Histological diagnosis		Cytological diagnosis	Histological diagnosis		Cytological diagnosis	Histological diagnosis		Sensitivity	Specificity
	No.of benign lesion	Benign	Malignant	No.of Malignant lesion	Malignant	Benign	No.of suspicious cases	DCIS	Benign		
Tiwari M [5]	16	15 (93.7%)	01 (6.25%)	05	05 (100%)	00 (00%)	-	-	-	83.3%	100%
O' Neil S etal [6]	166	153 (92.1%)	13 (7.83%)	401	398 (99.25%)	03 (0.75%)	125	84 (67.20%)	41 (32.8%)	97%	78%
Present study	41	39 (95.1%)	02 (4.8%)	23	23 (100%)	00 (00%)	02	02 (100%)	00 (00%)	92.5%	100%

Two cases which were cytologically diagnosed as a benign breast lesions were diagnosed as a malignant lesions by histopathological examination (false negative result). This might be due to sampling error or deep seated lesions

The two cases which were categorized as 'suspicious for malignancy' by cytology turned out to be premalignant lesions on histopathology and they were diagnosed as ductal carcinoma in situ.

The statistical analysis showed high sensitivity (92.5%) and specificity (100%) of FNAC in breast lesions, with Positive Predictive Value (PPV) and the Negative Predictive Value (NPV) being 100% and 95.1% respectively. The diagnostic accuracy was found to be 96.9%.

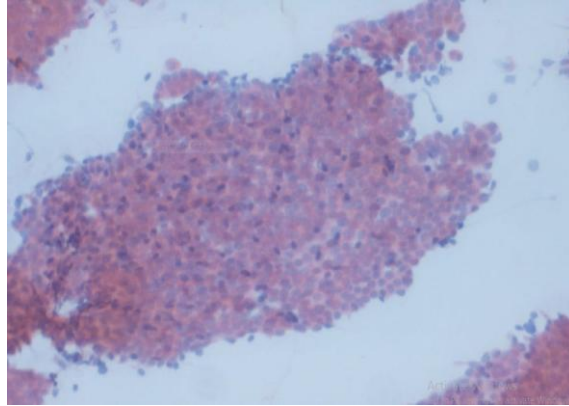**FIGURE 1 and 2: Cytology and Histology of fibroadenoma respectively.**
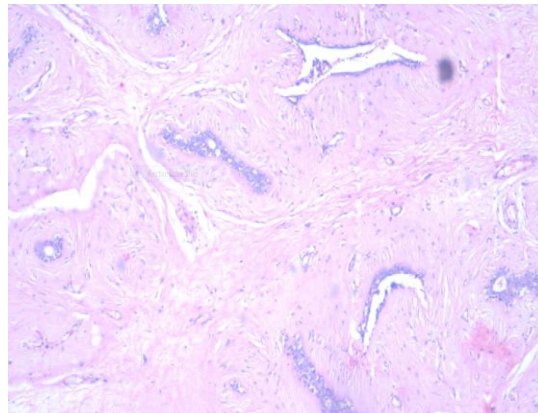

Figure 1 (PAP, 10X)

Figure 2 (H&E, 4 X)

FIGURE 3 and 4: Cytology and Histology of ductal carcinoma respectively.
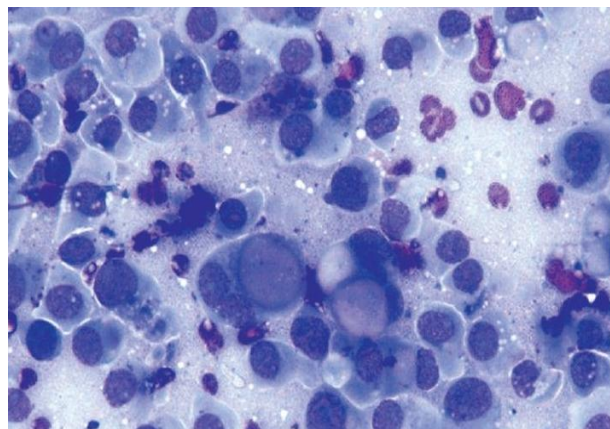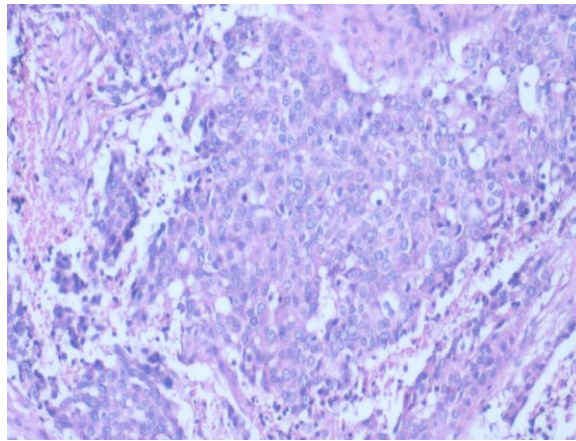

Figure 3 (MGG, 20X)

Figure 4 (H&E, 20 X)

Discussion

In the present study, out of 41 cytologically diagnosed benign cases, 39 cases were confirmed histopathologically as benign breast lesions. However, 2 cases which were misinterpreted as a benign lesions by FNAC, were diagnosed as a malignant lesions on histopathological study. (False negative rate- 4.8%). The false negative rate were 6.25% in Tiwari M study and 7.83% in O' neil S et al studies respectively. (Table-4)

Total 23 cytologically diagnosed malignant cases were confirmed as malignant on subsequent histopathological examination. So, in our study, a 100% cyto-histopathological correlations was observed for malignant lesions. Tiwari M had also observed the same results in their study.

In the present study, 2 cases which were cytologically diagnosed as ''suspicious for malignancy'' were confirmed as premalignant lesions (DCIS) on doing histopathological study.

In O'Neil S etal study out of 125 cases diagnosed as ''suspicious for malignancy'' 84 cases were confirmed as premalignant lesions (DCIS) on doing histopathological study. (Table-4)

In this study, sensitivity and specificity of breast FNAC were 92.5% and 100% respectively, which were quite comparable with the findings of other studies.

Conclusion:

Considering patient's comfort, rapid analysis, reporting and absence of false positive results make FNAC an ideal initial diagnostic modality in breast lumps. The FNAC provides high sensitivity and specificity with low rate of false negativity and false positivity on histopathological correlation of breast lesions. FNAC is helpful in preoperative evaluations and deciding further management and can avoid unnecessary surgical intervention.

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FIGURE 1 and 2: Cytology and Histology of fibroadenoma respectively.

FIGURE 3 and 4: Cytology and Histology of ductal carcinoma respectively.