



Original Research Article

Cytology of breast-lesions

Shreya Makhija^{1,*}, S. B Patil¹¹Dept. of Pathology, J.J.M Medical College, Davangere, Karnataka, India

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ABSTRACT

Introduction: Breast lesions are leading cause of morbidity and mortality in women worldwide. Fine Needle Aspiration (FNA) is an affordable, minimally invasive and rapid method. It is gaining importance as a preoperative procedure to distinguish benign and malignant breast lesions. Thus unnecessary invasive procedures can be avoided. This study is undertaken to explore utility and accuracy of FNA in various breast pathologies.

Objectives: 1) To study cytology of various breast lesions, 2) To correlate cytological diagnosis with histopathological diagnosis wherever possible, 3) To study sensitivity, specificity and accuracy of FNA in breast lesions

Materials and Methods: A two year prospective study was carried out from November 2017 to November 2019 at Department of Pathology, JJM Medical College – Davangere. This study included patients with breast lesions referred for FNA. FNA was done. Cytomorphological features were studied. Cytomorphological diagnosis was correlated with histopathological diagnosis wherever possible.

Results: Out of 425 patients with suspected breast lesions, cyto-histo morphological correlation was possible in 331 cases. Cytology histology concordance was 94.4%. This study has sensitivity of 90.1%, specificity of 96.5% and accuracy of 94.1%.

Conclusion: FNA is highly simple, safe and effective technique. It should be an essential component in preoperative diagnosis of breast lesions.

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1. Introduction

Breast lesions are one of the commonest diagnostic problems to clinicians as well as pathologists.¹ FNA is a simple and cost effective method. It helps in giving timely diagnosis.² Apart from confirming clinical diagnosis, FNA – breast also helps in distinguishing benign and malignant lesions.³ It plays a crucial role in management of patients who are unwilling or unfit for surgery.⁴

2. Objectives

1. To study cytology of various breast lesions,
2. To correlate cytological diagnosis with histopathological diagnosis wherever possible,

3. To study sensitivity, specificity and accuracy of FNA in breast lesions.

3. Materials and Methods

A prospective study of two year duration was done from November 2017 to November 2019 at Department of Pathology, JJMMC Davangere. It is a descriptive type of study. This study includes 425 patients with breast lesions referred for fine needle aspiration cytology to Department of Pathology.

3.1. Inclusion criteria

Patients of both sexes and all age groups were included.

* Corresponding author.

E-mail address: shreyamakh@gmail.com (S. Makhija).

3.2. Exclusion criteria

Un cooperative patients were excluded.

Informed consent was taken from the patients for the procedure and for being a part of this study. FNAC was done using a 22 gauge needle. Smears were made and stained with H & E and Giemsa. Cytomorphological features were studied. Yokohama system was applied for cytomorphological grading of breast lesions (Table 1). Yokohama system was framed by International Academy of Cytology and various experts in the field of breast cytology. It defines five categories for reporting cytology of breast lesions. These categories are stratified by their risk of malignancy.⁵

Table 1: 5 tier Yokohama system

Category	Interpretation	Risk of Malignancy (%)
C1	Insufficient Aspirate	2.6 – 4.8
C2	Benign	1.4 – 2.3
C3	Atypical	13.0 – 15.7
C4	Suspicious for malignancy	84.6 – 97.1
C5	Malignant	99.0 – 100.0

Histopathological specimens were processed routinely. Paraffin sections were stained with H&E and examined. Histopathological diagnosis was made independently. Cytopathological diagnosis was correlated with Histopathological diagnosis wherever possible. Results of this study were calculated by using methodology of Galen and Gambino.

4. Results

A total of 425 patients were cytologically diagnosed to have Breast Pathologies. The following observations were made.

Age group of patients referred for FNA ranged from 18 to 73 years. Most common age group was 31 to 40 years. In present study, 419 lesions (98.6%) occurred in females. Remaining 6 cases (1.4%) were males.

On applying 5 tier system of classification of breast lesions (Table 2), maximum number of cases belonged to C2 category followed by C5 category.

Table 2: Shows number and percentage of cases in various categories.

Category	Number of cases	Percentage of cases
C1	13	3.06
C2	268	63.06
C3	13	3.06
C4	29	6.82
C5	102	24.00
Total	425	100.00

Benign lesions constituted 268 cases (Table 3). Most common lesion in benign category was Fibroadenoma (Image 1 and 2) – 151 cases. This was followed by fibrocystic disease – 50 cases.

Table 3: Showing frequency of various benign lesions-

Serial Number	Breast Lesion	Total Cases
1	Fibroadenoma	151
2	Fibrocystic Disease	50
3	Benign Phylloids Tumor	8
4	Breast Abscess	7
5	Gynaecomastia	6
6	Lactation Adenoma	6
7	Acute Mastitis	6
8	Duct Ectasia	5
9	Galactocele	4
10	Lipoma	4
11	Foreign Body Granuloma	4
12	Chronic Granulomatous Mastitis	3
13	Usual Ductal Hyperplasia	3
14	Chronic Lobular Mastitis	3
15	Acute On Chronic Mastitis	3
16	Epidermal Inclusion Cyst	2
17	Non Caseating Granulomatous Mastitis	2
18	Juvenile Papilloma	1
	Total	268

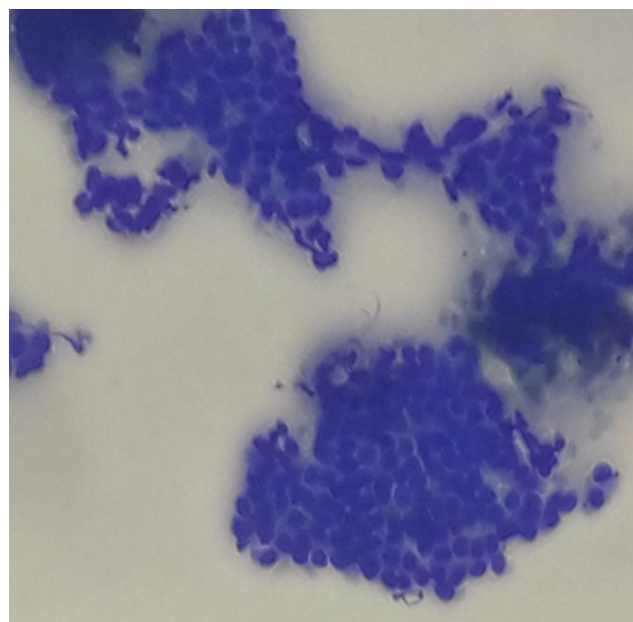


Fig. 1: Fibroadenoma cytology (Giemsa 40 x)

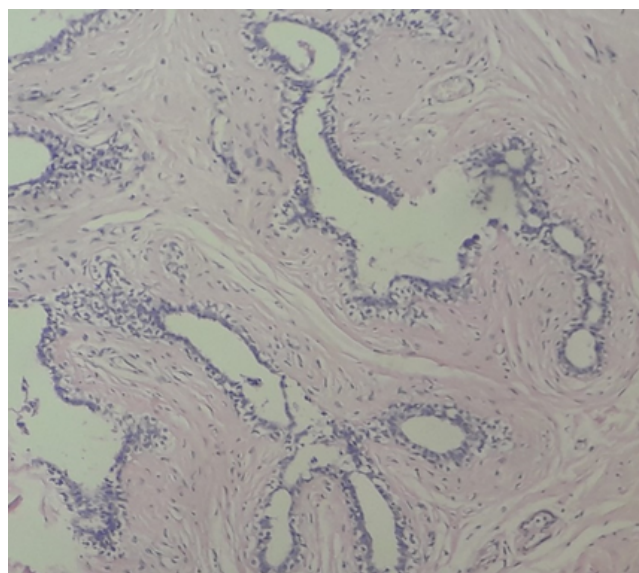
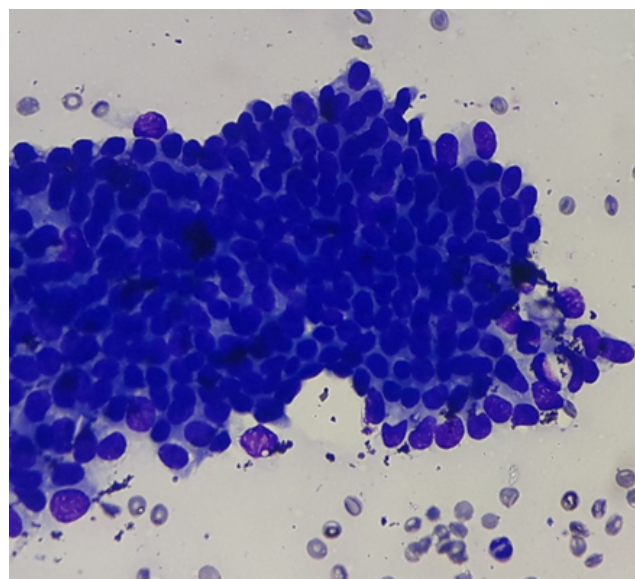
102 breast lesions belonged to malignant category (Table 4). Ductal Carcinoma (Image 3 and 4) was most common – constituting 82 cases.

Table 4: Showing various malignant lesions

Serial number	Breast Lesion	Number of cases
1	Ductal Carcinoma	82
2	Papillary Carcinoma	4
3	Medullary Carcinoma	3
4	Mucinous Carcinoma	2
5	Metastatic Adenocarcinoma	2
6	Lobular Carcinoma	2
7	Colloid Carcinoma	2
8	Metaplastic Carcinoma	2
9	Histiocytoid Carcinoma	1
10	Secretory Carcinoma	1
11	Carcinosarcoma	1
	Total Cases	102

Table 5: Cyto histo correlation was done in 331 cases

Cytology Category	Number of Cases	Histology	
		Benign	Malignant
C1	7	4	3
C2	197	187	10
C3	10	8	2
C4	26	1	25
C5	91	6	85
Total	331	206	125

**Fig. 2:** Fibroadenoma histology (H & E) 100X**Fig. 3:** Ductal Carcinoma - Cytology (Giemsa – 40 x)

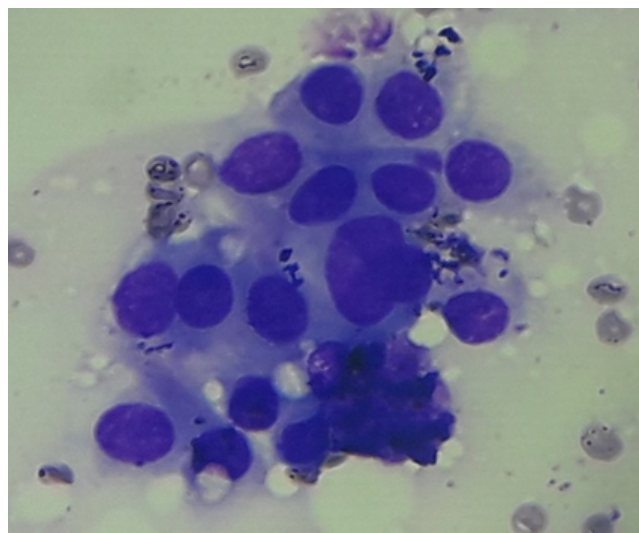
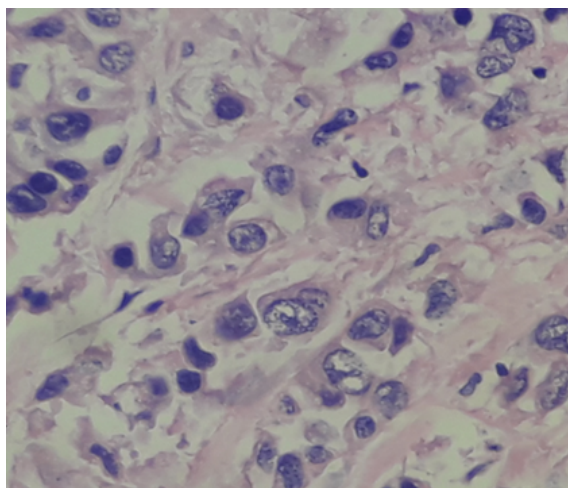
There was a cytology – histology concordance of 94.4%. Positive and Negative predictive values in our study are 94% and 94.2% respectively. Sensitivity, specificity and accuracy are 90.1%, 96.5% and 94.1%.

5. Discussion

FNA is considered one of the most reliable methods of diagnosing breast lesions. It is an outpatient procedure with minimal complications and very high diagnostic accuracy.⁹ Yokohama system stratifies breast lesions into 5 categories and ensures high quality of reporting which can help in appropriate management of patient.⁵

Table 6: Comparison of current study with various other studies

Serial number	Study	C1%	C2%	C3%	C4%	C5%
1	Anand V et al ⁶	4.9	39.7	24.02	5.39	20.5
2	Yusuf I et al ²	0	54.5	10	13.5	22
3	Kamatar PV et al ⁷	5	71	1	2	1
4	Wong S et al ⁸	11	72	4.3	2.2	10
5	Present	3.06	63.06	3.06	6.82	24

**Fig. 4:** Ductal Carcinoma cytology (Giemsa 100 x)**Fig. 5:** Ductal Carcinoma histology (H & E – 100 x)

As per 5 tier system of classification, maximum cases were in C2 category – 63.06%, followed by C5 category – 24%. Results were compared with other studies (Table 6) depicting 5 tier system.

Present study has 3.06 % insufficient aspirates. Percentage of aspirates in previous studies varied from 0.0% to 11.0 %.^{2,6–8} Reasons for insufficient aspirates are deep seated lesions and lesions with irregular borders. Most

common benign lesion in our study is fibroadenoma and commonest malignant lesion is Ductal Carcinoma. These results correlate with study conducted by Anand V et al⁶ and Paramesh et al.¹⁰

Our study has cytology histology concordance of 94.4%, which is very good when taking cost effectiveness, speed and simplicity of procedure into consideration. Similar results were obtained in study conducted by Anand V et al⁶ (89.7%). Sensitivity, specificity and accuracy are 90.1%, 96.5% and 94.1% which proves the efficacy and reliability of FNA in the field of breast lesions.

6. Conclusion

FNA is a very important technique for preoperative evaluation of patients with breast lesions. 5 tier system of grading breast lesions aids cytopathologists in diagnostic clarity. It also helps surgeons in deciding further patient management.

7. Source and funding

None

8. Conflict and interest

None

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Author biography

Shreya Makhija Post Graduate

S. B Patil Professor

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