

**CYTOMORPHOLOGICAL STUDY OF BREAST LESIONS WITH SONOMAMMOGRAPHIC CORRELATION**Sunita Haobam<sup>1</sup>, Urmila Thiyam<sup>2</sup>, D. C. Sharma<sup>3</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT:** Breast cancer is the second most common cancer worldwide and remains a major public health problem among women. Fine needle aspiration cytology (FNAC) is a reliable diagnostic tool to assess the nature of palpable breast lesions. **AIMS:** To assess cytomorphological study of breast lesions, to classify smears into C1-C5 and to correlate FNAC with biopsy, ultrasonography and mammography when available. **MATERIALS AND METHODS:** FNAC was done on 170 cases of breast lesions from September 2005 to Oct 2006 in the Department of Pathology, NSCB medical college, Jabalpur. Cases presenting with complaints of lump and pain were subjected to FNAC. Aspirations were done with 10ml syringe with a 22 gauge needle. Aspirates were smeared and air dried for MGG staining. **RESULTS:** Of the 170 cases malignancy accounted for 37.1%, benign lesion made up 50% and 10% constituted the gray zone (category C3 and C4). Most common benign lesion was fibroadenoma (48.8%) followed by fibrocystic disease (13.3%) and in malignant cases majority (80.9%) had infiltrating duct carcinoma followed by lobular carcinoma and medullary carcinoma. Mammography and sonography was done in 74 cases prior to FNAC. Diagnostic accuracy with mammography was 81.8%. 5 malignant cases on histology were reported as suspicious on radiology and 1 case was wrongly diagnosed as benign. **CONCLUSION:** Cytologic examination can confirm the presence of clinically suspected malignancies and classify the nature of atypical or suspicious lesion found on mammography. Active use of FNAC and sonomammography could cut down the number of surgical biopsies of benign breast lesions.

**KEYWORDS:** Breast lesions, FNAC, Cytology, Ultrasonography and Mammography.

**INTRODUCTION:** Breast cancer is the leading cause of death in many developed countries and is becoming frequent in developing countries as well. It is the second most common cancer in female in India following cervical cancer. (National cancer registry Annual report ICMR, 1984)

Fine needle aspiration cytology (FNAC) is a well-accepted technique for diagnosis and management of palpable solid palpable breast lumps. It has the advantages of being cost effective, speedy results and less patient morbidity. FNAC has a good sensitivity, specificity and accuracy in the diagnosis of both malignant and benign breast lumps. Radiological study of breast lesions helps in early diagnosis, differentiation of benign from malignant and detection of tiny cancers before they are symptomatic or palpable.

The present study was done to assess the cytomorphological study of breast lesions. To classify smears into C1-C5 category and to correlate FNAC with biopsy, ultrasonography and mammography when available.

**MATERIALS AND METHOD:** A total no of 170 cases have been included in our study for a period of one year from September 2005 to October 2006. All patients were examined in detail pertaining to

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the following features lump site, size, consistency, fixity to the skin or deeper tissues, nipple discharge tenderness and local temperature and presence of lymph nodes

**Procedure:** FNA was performed using 20cc syringe with a 22 gauge needle, with application of negative pressure under aseptic precautions. The aspirated material was smeared on glass slides and some of them were air dried and stained with May Grunwald Giemsa(MGG) and rest were fixed with 95% ethyl alcohol and stained with Pap Stain

The diagnostic criteria C1-C5 as recommended by National Health Service Breast screening program (NHSBSP) has been used for reporting the slides.

Ultrasonography and mammographic evaluation was done in 74 cases. Ultrasonographic examination of the breast lesions were performed on ATL-5000, HDI scanner using 5-12 MHz transducer. Film screen mammography was done on Mammomat 3000 NOVA (SIEMENS) machine. Two standard views, cranio-caudal and mediolateral –oblique views of each breast were taken with appropriate marker placed on axillary side of object table.

**RESULTS:** Out of 170 cases, benign lesions (Fig. 1) constituted 85(50%), malignant lesions accounted for 63(37.1%) and 17 cases (10%) belonged to the gray zone (category C3 and C4). [Fig. 2, 3].

The patients age group ranged from 12 to 86yrs. Maximum number of benign cases were between 30-39 yrs while malignancies were in the age group 40-49 years (Table1). Among benign lesions, fibroadenoma was found in 48.8%, fibrocystic disease in 13.3%, mastitis in 10%, phyllodes tumour in 2.2% and Gynaecomastia in 5.5% (Table 2).

The mean age for malignant cases was 48.4yrs. Majority (80.9%) cases of breast cancer had Infiltrating duct carcinoma (Fig. 4), 6.3% Lobular carcinoma, 4.7% Medullary carcinoma and 1.5% Malignant phyllodes tumour. (Table 3)

Among 170 cases, 05 were in C1 category, 85 in C2, 06 in C3, 11 in C4 and 63 in C5 category. (Table 4)

Ultrasonography and mammography were done in 74 cases prior to FNAC. Diagnostic accuracy with mammography was 81.8%.FNAC was found to be highly concordant with sonomammographic studies in malignant lesions. Out of 20 malignant cases on radiology 18 turned out be malignant on FNAC and the other two were reported as suspicious for malignancy. The concordance in benign lesion was slightly less (75%) as compared to malignant lesions.1 malignant case on cytology was wrongly diagnosed as benign on radiology.

**DISCUSSION:** FNAC is a sensitive, rapid, cost effective and a safe method in the evaluation of palpable breast lumps. It is less traumatic and provides immediate report to the patient and therefore widely accepted method for analyzing various breast lesions.<sup>[1,2,3]</sup>

The present study comprised of 170 cases. FNA smear analysis was done based on the cytological categories proposed by National Health Service Breast Screening program, UK. Sonomammography was performed in 74 cases and biopsy/mastectomy specimen were available in 63 cases only. Cytological correlation of sonomammography and histology was done and various statistical analysis obtained.

In this study the population ranged from 12 to 86 years. The mean age for malignant case was 48.6 years. Similar results have been reported in other studies.<sup>[1,2,3,4]</sup>

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Among the benign lesions fibroadenoma was commonest accounting for 48.8% followed by fibrocystic disease (13.3%). Other benign lesions encountered were mastitis suppurative (5.5%) and granulomatous (4.4%) cystosarcoma phylloides (2.2%), galactocele (1.1%) and gynaecomastia (5.5%). These findings are in accordance with other studies which showed similar results.<sup>[1,2,4]</sup>

In our study 2.9% cases had inadequate aspirate and were placed in C1 category. Sudarat N et al<sup>5</sup> in their study reported inadequate sample rate as 4.2%. Inadequate aspirate could be attributed to wrong technique, inexperience of the aspirator and type of lesion.<sup>5</sup> A few lesions with extensive fibrosis, sclerosis, adenosis and collagenous lesions, due to their nature, inadequate material is obtained.<sup>6</sup>

In our study the benign lesions in C2 category comprised 50% with fibroadenomas being most common (48.8%) benign lesion followed by fibrocystic disease (13.3%). In the study conducted by Rakhshindah B et al.,<sup>6</sup> 67.7% were fibroadenomas followed by fibrocystic disease (16.37%). In the present study spectrum of gray zone accounted for 10%, which is constituted by C3 (atypia probably benign) and C4 (suspicious for malignancy) with 3.5% and 6.5% respectively. Similar results were also obtained in study by Al-Kaisi N et al.<sup>7</sup> However the study conducted by Nour Sneige et al,<sup>8</sup> reported 10.4% as atypical and 11% as suspicious category.

Malignancy represented by C5 category accounted for 63 cases (37.1%). Majority malignant cases had Infiltrating Duct Carcinoma (80.9%).

In this study, FNAC, sonomammography and histopathology were available in 33 cases. 14 out of 20 histologically proven malignant cases were correctly identified radiologically and all 13 benign cases were correctly diagnosed radiologically. This gave diagnostic accuracy of 81.8% by radiology.

By FNAC the diagnostic accuracy was 93.9%. There was no false positive cases, however 2 malignant cases were missed on FNAC. One was a large cystic lesion which on repeated aspiration yielded acellular fluid which was later diagnosed as metaplastic carcinoma histologically. Presence of associated fibrocystic disease may be misleading because it may mask a malignancy<sup>9</sup>. Second case was of schirrous duct carcinoma, the smears of which were scanty and inadequate. FNAC tended to be inadequate and false negative in cases of Ductal carcinoma of Schirrous subtype.<sup>10</sup>

The sensitivity, specificity and positive predictive value of FNAC were 94.1%, 100% and 100% respectively. Similar results were also noted in other studies.<sup>[11,12]</sup>

Correlation between FNAC and sonomammography were available in 74 cases. FNA was highly concordant with sonomammographic studies in malignant category (90%). The concordance in benign lesions were slightly less (75%).

**CONCLUSION:** FNAC is an accurate, safe and relatively simple procedure with good patient acceptance and low morbidity. Cytologic examination can confirm the presence of clinically suspected carcinoma and clarify the nature of atypical or suspicious lesion found on mammographic or clinical examination. Aspiration biopsy augments the diagnostic effectiveness of clinical examination and mammography and should be performed in all questionable mammary lesions.

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Age in Years	No. of Cases	Percentage%
<20	16	9.4
20-29	34	20
30-39	40	23.5
40-49	43	25.3
50-59	19	11.2
>60	18	10.5
<b>Total</b>	<b>170</b>	<b>100</b>

**Table 1: Distribution of Cases According to Age**

Benign Breast Lesions	No. of Cases	Percentage %
Fibroadenoma	44	48.8
Fibrocystic Disease	12	13.3
Mastitis Suppurative	5	5.5
Granulomatous	4	4.4
Cystosarcoma Phyllodes	2	2.2
Galactocele	1	1.1
Gynaecomastia	5	5.5
Non Specific Cytology	12	13.3
Inadequate	5	5.5
<b>Total</b>	<b>90</b>	<b>100.00</b>

**Table 2: Distribution of Cytological Diagnosis of Benign Cases**

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Malignant subtype	No. of Cases	Percentage %
Duct Carcinoma	51	80.9
Lobular Carcinoma	4	6.3
Medullary Carcinoma	3	4.7
Mucinous Carcinoma	2	3.1
Papillary Carcinoma	2	3.1
Malignant Cstosarcoma Phyllodes	1	1.5
<b>Total</b>	<b>63</b>	<b>100.00</b>

Table 3: Distribution of malignant cytological diagnosis

Category	No. of Cases	Percentage%
C1 (inadequate)	5	2.9
C2 (benign)	85	50
C3 (atypia probably benign)	6	3.5
C4 (suspicious for malignancy)	11	6.5
C5 (malignant)	63	37.1
<b>Total</b>	<b>170</b>	<b>100</b>

Table 4: Distribution of Cases According to Cytological category

**Fig. 1:** Cytology category C2 (Benign) FNAC smear showing tightly cohesive clusters of ductal epithelial cells with bare nuclei in the background (Giemsa stain 100X).

**Fig. 2:** Cytology category C3 (Atypia probably benign) FNAC smear showing nuclear crowding and overlapping with holes corresponding to cribriform pattern (Giemsa stain 400X).

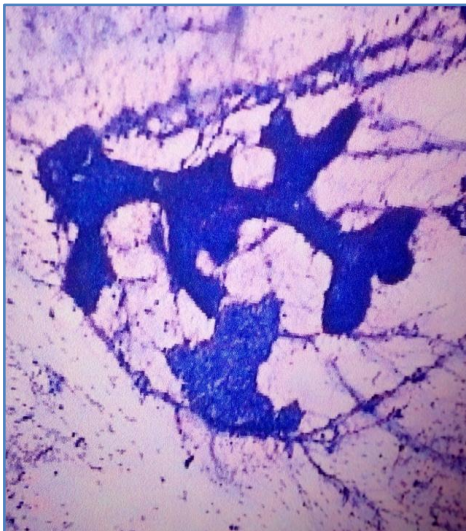


Fig. 1

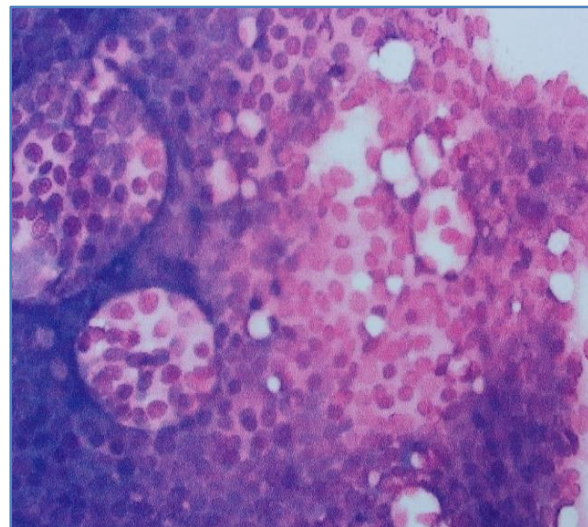
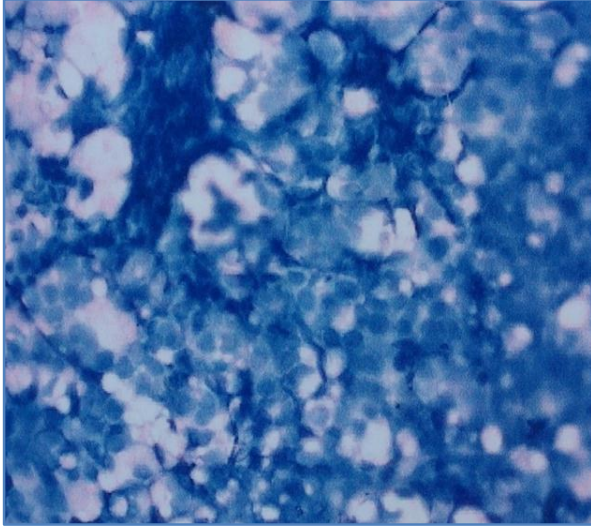


Fig. 2

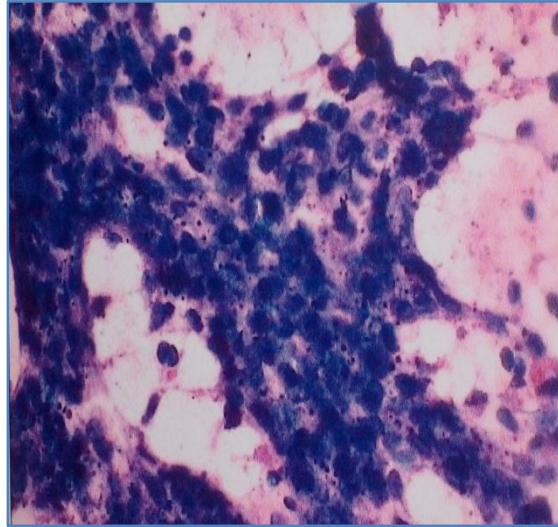
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**Fig. 3:** Cytology category C4 (Suspicious for malignancy) FNAC smear showing loosely cohesive cells with moderate nuclear atypia (Giemsa stain 400X)

**Fig. 4:** Cytology category C5 (Malignant) FNAC smear showing lack of cellular cohesion, nuclear and cellular enlargement and pleomorphism, prominent and multiple nucleoli (Giemsa stain 400X)



**Fig. 3**



**Fig. 4**

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