



**CORRELATION BETWEEN FINE-NEEDLE ASPIRATION CYTOLOGY AND HISTOPATHOLOGY FINDINGS IN THE EVALUATION OF PALPABLE AND RADIOLOGICALLY DETECTED SUSPICIOUS BREAST LESIONS, IN CHHATTISGARH INSTITUTE OF MEDICAL SCIENCES, BILASPUR, CHHATTISGARH**

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**ABSTRACT**

**Background:** As of the end of 2020, There were 7.8 million women alive who were diagnosed with breast cancer in past 5 year thus early diagnosis is necessary for proper management and to prevent early death of the patients. Clinical examination like size of tumour, consistency, mobility, overlying skin changes and adherence of underlying structures gives important clue for differentiation between benign and malignant lesion. Mammography/ultrasonography is another screening modality to categorization of breast lump in benign and malignant lesion. Histopathology is still the gold standard for the diagnosis of breast cancers. Self breast examination, screening programs, mammography, FNAC, MRI and immunohistochemistry also play important role in early diagnosis and proper management of the disease. **Objective:** To correlate the cytological findings with histopathological features in clinically and radiologically detected suspicious breast lesions. **Method:** This retrospective study was carried out in the department of pathology, Chhattisgarh Institute of Medical Sciences (CIMS), Bilaspur, (C.G.) during January 2015 to February 2022. Study included total of 200 cases with breast lesions among which cyto-histopathological correlations were obtained in 72 cases. The slides were stained with Haematoxylin and Eosin (H and E) stain. Cytological histopathological findings were analyzed. **Result:** The present study included 72 cases out of which 47 cases (65.27%) were benign and 25 cases (34.72%) were malignant. This study showed that frequency of right breast lesions were high (56%) compare to left (40%). There were (4.0%) bilateral cases. Frequency of Benign breast lesions was higher in less than 30 years (6 -35 years) age group and malignant lesions were more in higher than 30 years (25-70 year). 50 cases (69.44%) present as a lump, they are small, freely mobile, not associated with skin changes comes under benign. Rest 22 (30.55%) cases presented as lump with skin changes, discharge, nipple retraction, adhere to the chest comes under malignant lesion. The sensitivity of FNAC was found to be 96.00%, specificity of 100%, positive predictive value (PPV) of 100% and negative predictive value (NPV) of 97.91%. The accuracy rate was calculated as 98.6%. **Conclusion:** The present study concludes that clinical and radiological features support the diagnosis of FNAC and further confirms by histopathological examination. So FNA is very helpful for accurate and rapid diagnosis of breast lesions with high specificity, sensitivity and accuracy.

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**INTRODUCTION**

As of the end of 2020, there were 7.8 million women alive who were diagnosed with breast cancer in past 5 year so early diagnosis is necessary for proper management and prognosis to prevent early death of the patient. Histopathology is still gold standard. [1] Breast cancer is the commonest malignancy in women worldwide. Now a day's Triple assessment that is combination of three test clinical examination, mammography / ultrasonography and pathology is used for accurate diagnosis of breast cancer. Clinical examination like size of tumour, consistency, mobility, overlying skin changes and adherence of underlying structures gives important clue for

differentiation between benign and malignant lesion. Mammography/ultrasonography is another screening modality to categorization of breast lump in benign and malignant lesion. Fine needle aspiration (FNA), biopsy of breast was first used in the 1930s by Martin & Ellis and by Stewart at Memorial Hospital, followed in the late 1940s and early 1950s by Adair & Godwin, FNAC is first line, reliable, cheapest and vital tool for evaluation of palpable breast lumps in resource-limited settings like us. [2][3][4][5] FNA findings and there histomorphological features is essential for categorization of breast malignancy and final treatment of Breast cancer (mastectomy/ lumpectomy). Radiology (MRI/PET) play role

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in distance metastasis, IHC support further management of breast malignancies (chemotherapy, radiotherapy).

**Objective:** To correlate the cytological findings with histopathological features in clinically and radiologically detected suspicious breast lesions.

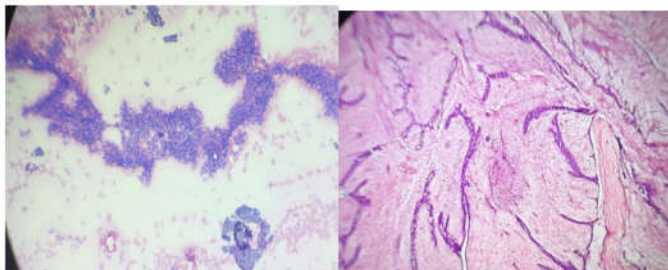
**MATERIAL AND METHODS**

**Method:** This retrospective study was carried out in the department of pathology, Chhattisgarh Institute of Medical Sciences (CIMS), Bilaspur, (C.G.) during January 2015 to February 2022. Study included total of 200 cases with breast lesions among which cyto-histopathological correlations were obtained in 72 cases. The slides were stained with Haematoxylin and Eosin (H and E) stain. Women with metastasis disease and who already received radiotherapy /chemotherapy were excluded from the study. Data related to clinical and radiological examination were collected from cytology and histopathology registers and requisition form. Cytological histopathological findings were analyzed.

**RESULTS**

The results are as follows:

The present study included 72 cases out of which 47 cases (65.27%) were benign and 25 cases (34.72%) were malignant. This study showed that frequency of right breast lesions were high (56%) compare to left (40%). There were (4.0%) bilateral cases. Frequency of Benign breast lesions was higher in less than 30 years (6 -35 years) age group and malignant lesions were more in higher than 30 years (25-70 year). 50 cases (69.44%) present as a lump, they are small, freely mobile, not associated with skin changes comes under benign. Rest 22 (30.55%) cases presented as lump with skin changes, discharge, nipple retraction, adhere to the chest comes under malignant lesion. In which Fibroadenoma (Figure1) 18 cases (25%) constituted the most common benign breast lesion followed by fibrocystic disease (Figure 2) 11cases (15.27%). Infiltrating ductal carcinoma (Figure 4) 11 cases 15.27% was most common malignant breast lesion higher in 41 to 50 years, followed by medullary carcinoma (Figure 6) 4 cases 5.55%, Lobular carcinoma 3 cases (2.77%) (Figure5). The statistical analyses of FNAC with respect to breast malignancy were done (Table 3, 4). The sensitivity of FNAC was found to be 96.00%, specificity of 100%, positive predictive value (PPV) of 100% and negative predictive value (NPV) of 97.91%. The accuracy rate was calculated as 98.6%.



**Fig 1** Fibroadenoma- Benign ductal epithelium arranged in antler staghorn pattern cytology (40x).Gland are composed into linear branching structure by proliferation of stroma histology(40x),

**Table 1** Clinical presentation of breast lesions.

Breast Lump	50 (69.44%)
Breast Lump with Nipple Discharge	04(5.55%)
Breast Lump with skin changes	08(11.11%)
Breast Lump with skin changes and Nipple Retraction	06(8.33%)
Breast Lump with Ulceration	04(5.55%)

**Table 2** Benign and Malignant lesions as per FNAC and Histopathology

Category		No. of cases diagnosed on cytology	No. of cases diagnosed on histopathology	Percentage as per histopathology
Inflammatory Lesions (6 cases)	Granulomatous mastitis	05	05	6.94%
	Fat necrosis	01	01	1.38%
	Fibroadenoma	18	18	25%
	Fibrocystic disease	12	11	15.27%
Benign Breast Lesions (34Cases)	Epithelial hyperplasia	02	02	2.77%
	Galactocele	01	01	1.38%
	Lactational Adenoma	02	02	2.77%
Lesion Not Recognized As Benign or Malignant (2 Cases)	Pyllodes	02	02	2.77%
	Atypical/Indeterminate Probably Benign (5 case)	05	05	6.94%
Suspicious of Malignancy (5 cases)	Total	48	47	
	Atypical cells suspicious of malignancy	05	05	6.94%
Malignancy (20cases )	Infiltrating ductal carcinoma	10	11	15.27%
	Medullary ca	04	04	5.55%
	Lobular ca	02	02	2.77%
Total	Papillary ca	03	03	4.16%
		24	25	

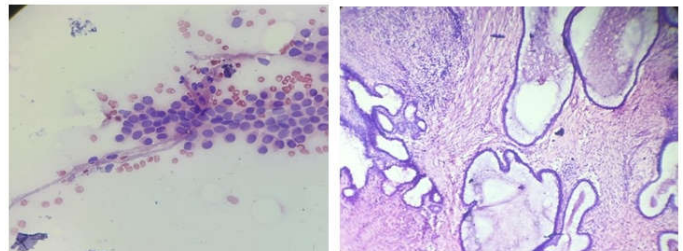
**Table 3** Cyto-histological correlation of breast lesions

Cytological diagnosis	Histological diagnosis		Total
	Malignant lesions	Benign lesion	
Malignant lesions	24(True positives)	00(False positive)	24
Benign lesion	01(False negative)	47(True negatives)	48
	25	47	72

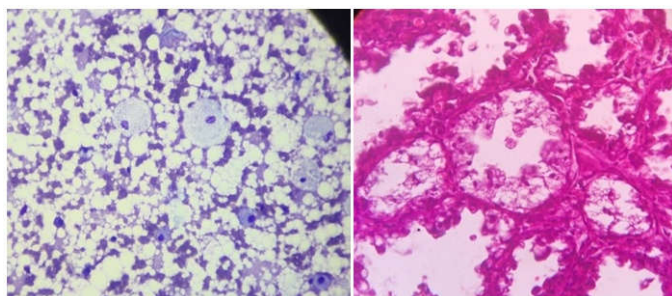
**Table 4** Comparative analysis of FNAC in breast lesions by different authors.

Study	Sensitivity	Specificity	PPV	NPV	Accuracy rate
Risaldar <i>et al.</i> , (2020)6	91.66	100	100	98	98.4
Patel A <i>et al</i> 7 (2018)	97.46	100	100	100	99.02
Ibikunle DE <i>et al</i> 8 (2017)	99.4	100	100	66.7	-
Khageshan AP <i>et al</i> 9 (2015)	96.97	100	100	98.63	99.05
Sankaye SB <i>et al</i> 10 (2014)	88.37	96.42	97.43	84.37	91.54
Present study	96.00	100	100	97.91	98.6

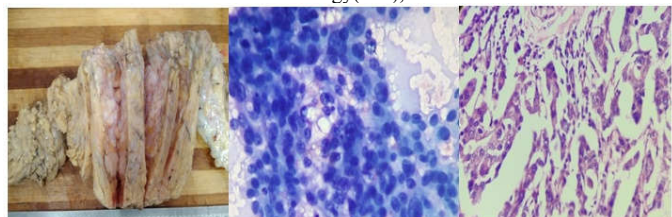
PPV = Positive predictive value, NPV = Negative predictive value



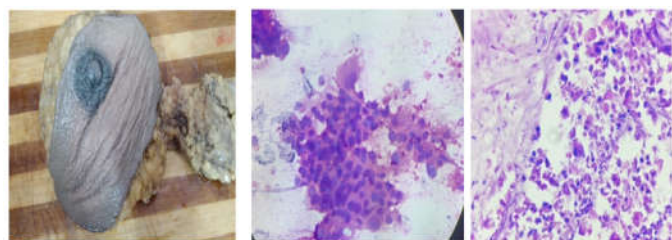
**Fig 2** Fibrocystic disease-Apocrine changes in ductal cells against fluidic background cytology(40x), adenosis with cystically dilated duct and lobules containing eosinophilic secretion and foamy macrophages. histology(40x),



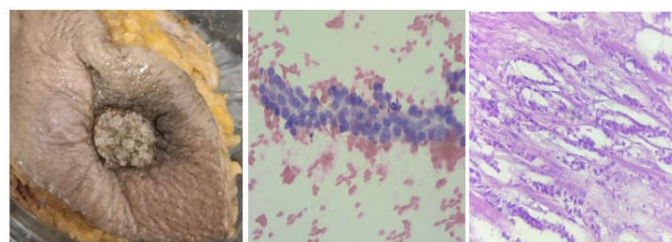
**Fig 3** Lactational adenoma-milk laden macrophages cytology (40x), proliferation of hyperplastic closely packed lobules, glands lined by cuboidal cells with round nuclei and granular to clear cytoplasm histology(40x),



**Fig 4** Clinical examination and Gross -7.0x7.0x 5.0 cm, firm, nonmobile, nontender mass at retroareolar region on cut section-whitish, firm mass with crab like extensions. cytology(40x)- Tumor cells in loose cohesive sheets showing nuclear pleomorphism, hyperchromasia, prominent nucleoli with high n:c ratio. Histology(40x)- Infiltrating ductal carcinoma NOS type showing tubules and sheets.



**Fig 5** Clinical examination and Gross -3.0x2.00x0.5cm, soft to firm, nonmobile, nontender at retroareolar mass, overlying skin show redness. on cut section-whitish, fleshy mass. Cytology (40x)- bezzre tumor cells in sheet. Histology (40x)- Infiltrating lobular carcinoma with medullary changes.



**Fig 6** Clinical examination and Gross -8.0x7.0x5.0 cm, firm to hard nonmobile, nontender mass at center of breast, nipple retraction, excoriation and puckring of skin. on cut section-whitish, irregular mass. cytology(40x)- Paucicellular smear Tumor cells, shows mild atypia with scant cytoplasm. Histology (40x)- Infiltrating ductal carcinoma showing Indian file pattern..

## DISCUSSION

The aim of the present study was to correlate the cytological findings with histopathological features in clinically and radiologically detected suspicious breast lesions. Early detection and screening can decrease breast carcinoma mortality around 18-29%.<sup>[6]</sup> FNAC of palpable breast lumps is a well accepted and established, diagnostic tool for determining the benign or malignant breast lesions with high degree of accuracy. Further this is helpful in early detection and accurate management.<sup>[7]</sup> In present study most common malignant breast lesion was infiltrating ductal carcinoma 11 (44%), which is also most common in study by Dominguez *et al* and Srikanth *et al*.<sup>[8][9]</sup> In present study distribution of

breast lesions were more in the right breast (75%) compared to left breast differ from findings were seen by Meena *et al* and Reddy *et al*.<sup>[10][11]</sup> The present study had almost 98.6% of well correlation of cytology to histopathology which correlates well with Risaldar *et al*, Rupom *et al*<sup>[12]</sup> and Chiemchanya *et al*.<sup>[13]</sup> The sensitivity of 96.00% in our study is comparable with that of various authors shown in Table 4, where sensitivity ranges from 86% to 99%. In present study, there was no false positive case, hence positive predictive value (PPV) and specificity calculated as 100% which is similar to Risaldar *et al*,<sup>[14]</sup> Patel A *et al*<sup>[15]</sup> Ibikunle DE *et al*,<sup>[16]</sup> Khageshan AP *et al*,<sup>[17]</sup> Sankaye SB *et al*.<sup>[18]</sup> had specificity of 96.42% and PPV of 97.43%, is relatively rare in breast FNAC which is more accurate with the help of correlation of additional clinical and radiological findings, early screening procedure with triple assessment of breast lesion reduce morbidity, mortality and increased survival of patient.

## CONCLUSION

The present study concludes that clinical and radiological features support the diagnosis of FNAC and further confirms by histopathological examination. So FNA is very helpful for accurate and rapid diagnosis of breast lesions with high specificity, sensitivity and accuracy.

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