

## The cyto-histopathological evaluation of breast lesions in a tertiary care hospital- A two years study

Rajshri P. Damle<sup>1</sup>, Smita A. Bora<sup>2,\*</sup>, Maya S. Vasaikar<sup>3</sup>

<sup>1,3</sup>Associate Professor, <sup>2</sup>Assistant Professor, <sup>2</sup>Dept. of Pathology, Shri Bhausaheb Hire Government Medical College, Dhule, Maharashtra, India

\*corresponding Author: Smita A. Bora

Email: drsmitabora@rediffmail.com

### Abstract

**Introduction:** Palpable breast lump is a common presenting complaint so diagnostic evaluation is mandatory. Fine needle aspiration cytology (FNAC) is one of the first line investigation in the diagnosis of palpable breast lesions in resource limited settings but histopathological examination is more valuable for confirmatory diagnosis. Aim of the study was to categorize breast lesions and correlate the fine needle aspiration cytology (FNAC) diagnosis with histopathological findings.

**Materials and Methods:** The descriptive study was conducted in a tertiary care hospital over a period of two years from Jan 2016-Dec 2017. Total 273 patients underwent fine needle aspiration cytology (FNAC) of palpable breast lump after taking detailed clinical history. The cytomorphological diagnosis was given and then subsequent biopsy/mastectomy specimens were received. Finally cytohistopathological correlation was done.

**Result:** Out of total 273 cases of palpable breast lump, 148 cases (54.21%) were benign, 45 (16.4%) were malignant, 14 (5.12%) were suspicious for malignancy and 66 cases (24.17%) were other non-neoplastic lesions on cytological examination. Majority of cases (34.09%) were in 21-30 years of age group. Out of 14 cases of suspicious for malignancy on cytology 5 cases were diagnosed as benign on histopathology. The sensitivity, specificity, positive predictive value and negative predictive value of malignant cases is 100%, 97.7%, 91.5% and 100% respectively.

**Conclusion:** Correlation of FNAC and histopathological examination is useful for confirmation of diagnosis and management of breast lesions.

**Keywords:** Palpable breast lump, Fine needle aspiration cytology, Histopathological examination.

### Introduction

Palpable breast lump is the most common clinical presentation which may be non-neoplastic or neoplastic lesion but most of the lesions are benign in nature.<sup>1</sup> FNAC is a useful tool in diagnosis of palpable breast lesions as well as male breast, accessory breast and axillary tail lesions.<sup>2</sup> Thus FNAC have reduced the number of open breast biopsies.<sup>3</sup> The FNAC is highly sensitive, easy to perform and cost effective method. But it is always not possible to reach a definite diagnosis on the basis of FNAC alone, so histopathological confirmation is necessary for definitive diagnosis of recurrent, suspicious and neoplastic lesions.<sup>4,5</sup> The aim of our study is to compare the diagnostic accuracy of FNAC with histopathological examination.

### Materials and Methods

A cross-sectional descriptive study was conducted in the Department of Pathology Government Medical College, Dhule from Jan 2016-Dec 2017. The present study included 273 cases presenting with breast lumps referred to cytology department. Detailed clinical history including pain, nipple discharge, ulceration and duration of lesion were noted. The examination of breast was done with size and site of lump, consistency, fixation to skin and underlying tissue with regional lymph node involvement. After explanation of procedure and taking informed consent of patient, FNAC was performed under all aseptic precautions, by using 10cc disposable syringe and 22/23 gauge needle without anaesthesia. Smears were prepared then fixed in methanol and stained by Hematoxylin and Eosin, Pap stain and

Giemsa stain. ZN stain for acid fast bacilli was done in suspected of tuberculous lesions. Subsequent biopsies/mastectomy specimens sent from surgical department were grossed, processed by paraffin embedding and stained with Hematoxylin and Eosin.

**Inclusion criteria:** All male/females with clinically palpable breast lumps.

**Exclusion criteria:** Inadequate aspiration and who underwent FNAC but did not undergo subsequent histopathological examination were excluded from the study.

According to the National Cancer Institute (NCI) guidelines in 1996, FNAC of the breasts were categorized into inadequate (C1); benign (C2); atypical, probably benign (C3); suspicious, favor malignancy (C4) and malignant (C5).<sup>6</sup> NCI recommended these categories in order to bring a degree of uniformity to the diagnostic reporting.

### Results

The present study included 273 cases of palpable breast lesions which underwent FNAC and biopsies. The study included 12 cases of male (4.3%) and 261 cases of female (95.60%). Maximum numbers of cases of breast lump were in the 21-30 years of age group. (Table 1). Out of total 273 cases, 141 cases (51.64%) were benign, 7 cases (2.56%) were atypical probably benign, 45 (16.4%) were malignant, 14 (5.12%) were suspicious for malignancy and 66 cases (24.17%) were other non-neoplastic lesions. (Table 2). In present study 141 cases were diagnosed benign on cytology. Out of which 124 cases as fibroadenoma, 5 cases as

fibrocystic disease, 5 cases as lactating adenoma, 3 cases as tubular adenoma and 4 cases as phylloids tumour diagnosed on histopathology. On cytology 14 cases diagnosed as inflammatory lesions and on histopathology 9 cases as mastitis, 3 cases as fibrocystic disease and 2 cases as granulomatous mastitis were diagnosed. On cytology 7 cases diagnosed as atypical probably benign but on histopathological examination diagnosed as fibrocystic disease and fibroadenoma. This is because of occasional tight clusters with dissociation, mild nuclear atypia and high cellularity on cytology smears.

On cytology 45 cases were diagnosed as malignant out of which histopathologically 43 cases diagnosed as infiltrating duct carcinoma of breast, two cases diagnosed as medullary carcinoma of breast. 14 cases were suspicious for malignancy on cytology out of which 7 cases were diagnosed as infiltrating duct carcinoma, 2 cases were duct carcinoma in situ, 3 were fibrocystic disease of breast and 2 cases were of sclerosing adenosis. (Fig. 1) 4 cases diagnosed as epidermal cyst on cytology which were confirmed on histopathology. 7 cases diagnosed as gynaecomastia and 9 cases of galactocele on cytology were confirmed on histopathology. 10 cases diagnosed as granulomatous mastitis out of which 6 cases were diagnosed as tuberculous mastitis on histopathology later which were confirmed on Z-N stain. (Fig. 2)

### Statistical Analysis

In present study cytohistopathological correlation was done in all cases, 268 cases were consistent on histopathology and 5 cases were inconsistent.

Histopathology Cytology	Positive cases	Negative cases
Positive cases	54	05
Negative cases	0	219

True positive cases (TP) – 54  
 True negative cases (TN) – 219  
 False positive cases (FP) – 5  
 False negative cases (FN) – 0

Sensitivity -100%  
 Specificity – 97.7%  
 Positive predictive value – 91.5%  
 Negative predictive value – 100%

### Discussion

In 1930, Martin and Ellis described and first introduced the technique of FNAC for diagnosis of different organ lesions.<sup>7</sup> FNAC is the diagnostic tool in preoperative assessment of breast masses and it has high diagnostic accuracy, sensitivity and specificity.<sup>8</sup> FNAC is a part of triple test and also as initial investigation and screening of breast lump however a definitive conclusion should always be reached through histopathological examination.

The present study was carried out over a period of two years to find out the diagnostic accuracy of FNAC by its comparative study with histopathological diagnosis. FNAC

was performed on 273 patients and these were followed by histopathological examination. Majority of patients were female with M: F of 1:22.5. Similar results were reported by Mahajan NA et al.<sup>9</sup>

The age range was 11-81 years and maximum numbers of patients were in the age group of 21-30 yrs which was in concordance with Chauhan SC et al<sup>10</sup> and Mahajan NA et al.<sup>9</sup> The most common finding was benign lesions than malignant lesion on cytology in which fibroadenoma was the predominant findings in benign and infiltrating duct carcinoma was in malignant lesions in our study. Similar findings reported by Choksi M et al,<sup>11</sup> Debra AB et al<sup>12</sup> and Mohammad Q et al.<sup>13</sup> On cytology out of 273 cases 51% were benign, 16.4% malignant, 5.12% suspicious for malignancy and 24.17% non-neoplastic lesions. Pandey V et al,<sup>14</sup> Chauhan SC et al<sup>10</sup> and Mahajan NA et al<sup>9</sup> observed slightly higher incidence of benign lesions and malignant lesions than our study but the percentage of non-neoplastic lesions was higher in our study than these studies. In our study 7 cases of gynaecomastia and 9 cases of galactocele diagnosed on cytology which were higher than other studies.<sup>9-10</sup> Mehra K et al<sup>15</sup> has found 2 cases of granulomatous mastitis on FNAC. We reported 10 cases were diagnosed on cytology as granulomatous mastitis and 6 cases diagnosed as tuberculosis were confirmed on histopathology. In our study we diagnosed 4 cases of phyllodes tumour on histopathology which were diagnosed on cytology as benign breast disease. Similarly Pandey V et al<sup>14</sup> also found 2 cases of phyllodes tumour on histopathology.

We observed rare cases of epidermal cyst on cytology later on histopathology confirmed the diagnosis. The main feature of epidermal cyst was nucleated and anucleated squamous cells along with few ductal epithelial cells. Epidermal cyst of breast is uncommon benign lesion. In the literature only few cases have been reported. It presents as breast lump mainly in peri-alveolar region and needs to be differentiated from other breast lesions.<sup>21, 22</sup> We found 5 false positive cases on cytology, these were diagnosed as suspicious for malignancy. Later on those diagnosed as fibrocystic disease and sclerosing adenosis on histopathology. On cytology smears shows slight loss of cohesiveness of ductal epithelial cell clusters with mild nuclear atypia suggestive of suspicious of malignancy but subsequent histopathological examination revealing features of benign lesion. Similarly diagnosis of sclerosing adenosis is very difficult on cytology due to high cellularity, microacinar patterns of epithelial cells and mild pleomorphism. To minimize the false positive cases cytohistopathological correlation is needed.

In our study we did not find any false negative case due to properly executed FNAC procedure and proper cytological reporting. The sensitivity, specificity, positive predictive value and negative predictive value of malignant cases is 100%, 97.7%, 91.5% and 100% respectively. The high sensitivity and predictive value of negative cases gives us confidence of not missing malignant cases.

**Conclusion**

FNAC is an excellent diagnostic tool in assessing palpable breast masses. It has few limitations so

histopathology is necessary for providing definitive diagnosis and for appropriate therapeutic regimes.

**Table 1: age and sex wise distribution of breast lesions (n=273)**

Age in years	Males	Female
11-20	02	54
21-30	02	89
31-40	00	43
41-50	01	35
51-60	04	27
61-70	01	08
71-80	02	05
<b>Total</b>	<b>12</b>	<b>261</b>

**Table 2: Cytological diagnosis**

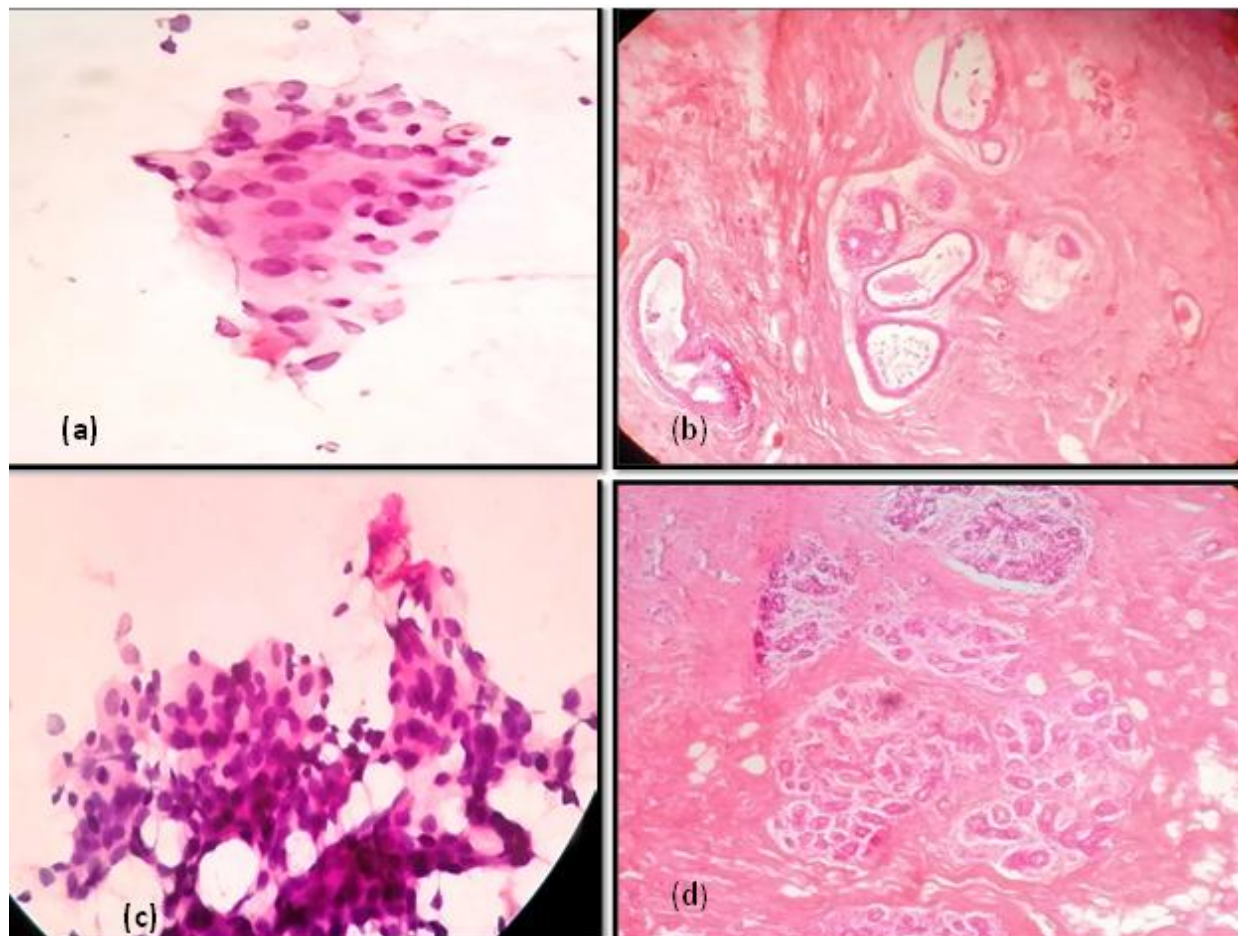
Cytological diagnosis	No. of cases	Percentage
C1- Inadequate	00	00%
C2- Benign	141	51.64%
C3 – Atypical probably benign	07	2.56%
C4 – Suspicious of malignancy	14	5.12%
C5 – Malignant	45	16.48%
<b>Other (non-neoplastic)</b>		
Inflammatory	14	21.2%
Fibrocystic disease	22	33.3%
Galactocele	09	13.6%
Gynecomastia	07	10.60
Granulomatous lesion	10	15.1%
Epidermal cyst	04	6.06%
<b>Total</b>	<b>273</b>	<b>100</b>

**Table 3: Cytological and histopathological correlation**

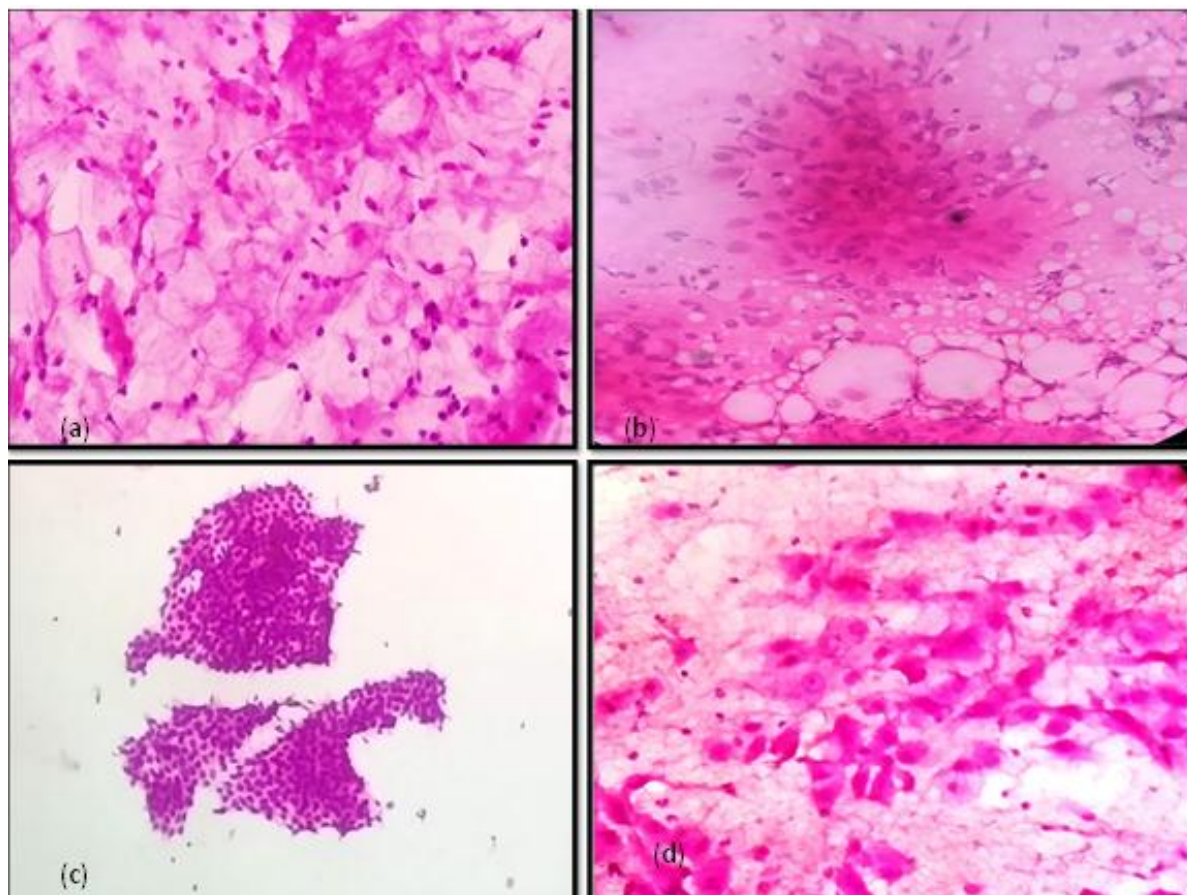
Cytological Diagnosis	No. of cases	Fibroadenoma	Sclerosing adenosis	Tubular denoma	IDC	Medullary Ca	DCIS	Lactating adenoma	FCD	PT	Epidermal Cyst	mastitis	Granulomatous mastitis	Tuberculous mastitis	Gynecomastia	Galactocele	Total
Benign	<b>141</b>	124	00	03	00	00	00	05	05	04	00	00	00	00	00	00	<b>141</b>
Atypical	<b>07</b>	03	00	00	00	00	00	00	04	00	00	00	00	00	00	00	<b>07</b>
Malignant	<b>45</b>	00	00	00	43	02	00	00	00	00	00	00	00	00	00	00	<b>45</b>
Suspicious	<b>14</b>	00	02	00	07	00	02	00	03	00	00	00	00	00	00	00	<b>14</b>
Inflammatory	<b>14</b>	00	00	00	00	00	00	00	03	00	00	09	02	00	00	00	<b>14</b>
Fibrocystic	<b>22</b>	03	00	00	00	00	00	00	00	00	15	00	04	00	00	00	<b>22</b>
Galactocele	<b>09</b>	00	00	00	00	00	00	00	00	00	00	00	00	00	00	09	<b>09</b>
Gynecomastia	<b>07</b>	00	00	00	00	00	00	00	00	00	00	00	00	00	07	00	<b>07</b>
Granulomatous	<b>10</b>	00	00	00	00	00	00	00	00	00	00	00	04	06	00	00	<b>10</b>
Epidermal cyst	<b>04</b>	00	00	00	00	00	00	00	00	00	04	00	00	00	00	00	<b>04</b>
<b>Total</b>	<b>273</b>	<b>130</b>	<b>02</b>	<b>03</b>	<b>50</b>	<b>02</b>	<b>02</b>	<b>05</b>	<b>15</b>	<b>04</b>	<b>19</b>	<b>09</b>	<b>10</b>	<b>06</b>	<b>07</b>	<b>09</b>	<b>273</b>

**Table 4: Comparison of accuracy on FNAC**

Author study	Sensitivity	Specificity	Positive predictive value	Negative predictive value
Muhammed et al <sup>16</sup>	90.6%	100%	100%	99%
Ishikawa et al <sup>17</sup>	86.3%	98.2%	97.9%	-
Singh A et al <sup>18</sup>	84.6%	100%	-	-
Khemka et al <sup>19</sup>	96%	100%	100%	95.12%
Bukhari et al <sup>20</sup>	98%	100%	97%	100%
Mahajan et al <sup>9</sup>	96.66%	98.66%	96.77%	98.66%
Chauhan et al <sup>10</sup>	98.24%	98.93%	96.55%	99.46%
Present study	100%	97.77%	91.53%	100%



**Fig. 1:** (a) Cytological smears of suspicious of malignancy showing clusters of ductal epithelial cells having mild pleomorphism (H and E x400) (b) Section of fibrocystic disease showing cystic dilation with apocrine change (H and E x400) (c) Cytological smears of suspicious of malignancy showing clusters of ductal epithelial cells having mild nuclear atypia (H and E x400) (d) Histopathological section of sclerosing adenosis (H and E x100)



**Fig 2: (a) cytological smear shows features of epidermal cyst (H and E x 400) (b) cytological smear shows tuberculous mastitis (H and E x 400) (c) cytological smears shows features of fibroadenoma (H and Ex 400) (d) cytological smears shows features of malignant lesion (H and E x 400)**

**Conflicts of Interest:** None.

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