

# Cytological and Histopathological Correlation of Breast Lump: A 3 Year Study at Tertiary Care Center

Sanjaykumar C. Chauhan, Ankur N. Sarvaiya\*

Dept. of pathology, GMERS Medical College, Himmatnagar, Gujarat, India

## ABSTRACT

**Background:** The fine needle aspiration cytology (FNAC) is an OPD procedure that is easy to perform, accurate, reproducible and cheap. Fine needle aspiration is a part of triple test to diagnose the breast lump. However a definitive conclusion should always be reached through histopathological examination

**Aim:** The aim of our study is to correlate cytological diagnosis with histopathological diagnosis, to know clonimorphologic spectrum of breast lump, and to figure out sensitivity, specificity, positive predictive value, negative predictive value and efficiency of FNAC.

**Methods:** Total 244 cases who were subjected to FNAC and then subsequent biopsy was sent in each case were taken into consideration for analysis from tertiary care center in north Gujarat from February 2014 to January 2017 for 3 years.

**Results:** In our study, 4 were males and 240 were females (1.64% and 98.36% respectively). Maximum cases of breast lump were in the 21-30 years age group. Out of total 244 cases 154 (63.11%) were benign, 50 (20.49%) cases were malignant, 08 (3.27%) were suspicious for malignancy and 32 (13.11%) were other nonneoplastic. Out of total 244 cases, 241 were consistent on histopathology and 3 were inconsistent. Our study have Sensitivity, Specificity, Positive predictive value, Negative predictive value, and Efficiency to be 98.24%, 98.93%, 96.55%, 99.46% and 98.77% respectively.

**Conclusion:** FNAC helps the surgeon on further accurate management of lump as it is sensitive and specific. FNAC results should be correlated with clinical findings and radiological investigations. Inconclusive results and on FNAC should always be confirmed with biopsy.

**Keywords:** Cytology, Biopsy, Histopathology, Breast lump

## Introduction

Breast lump is a common feature of most of the breast pathology. Many women in their life suffer from breast lump. Most of the breast lump cases are benign in nature.<sup>[1]</sup> This lump feature can cause an anxiety in the patients. Breast cancer is second commonest type of cancer after cervical cancer in India.<sup>[2]</sup> Mostly it also is presented as lump.

The fine needle aspiration cytology (FNAC) is an OPD procedure that is easy to perform, accurate, reproducible and cheap.<sup>[3,4]</sup> Fine needle aspiration is a part of triple test.<sup>[5]</sup> Triple test consists of combined clinical examination, mammography and fine needle aspiration. However a definitive conclusion should always be reached through histopathological examination as it is universally accepted. Previously excisional biopsy was widely practiced, but preoperative evaluation by FNAC have number of benefits.<sup>[6,7]</sup> FNAC can be done with ultrasonographic guidance for better results.<sup>[8]</sup> It can also be used as an evaluation tool post lumpectomy.<sup>[9]</sup> It can also evaluate male breast, accessory breasts and axillary lymph nodes accurately.<sup>[10,11]</sup> In benign breast lesions triple test has reduced open biopsy rate.<sup>[12]</sup>

The aim of our study is to correlate cytological diagnosis with histopathological diagnosis, to know clonimorphologic spectrum of breast lump, and to figure out sensitivity, specificity, positive predictive value, negative predictive value and efficiency of FNAC.

## Materials and Methods

Total 244 cases who were subjected to FNAC and then subsequent biopsy was sent in each case were taken into consideration for analysis from tertiary care center in north Gujarat from February 2014 to January 2017 for 3 years. The study was retrospective in nature. Consent was taken for performing FNAC in every case. Findings about age, site, size, consistency, mobility, ulceration, pain, discharge, duration of lump, fixation to skin etc. were noted. Ultrasonography findings were noted wherever performed. FNAC performed with 10 ml syringe and 23G needle after proper cleaning of site with spirit and antiseptic solution. Findings on aspiration were noted. Material taken on glass slide spread with pressure by another glass slide. Slides fixed with methanol and then stained with hematoxylin and eosin stain for cytology. Slides mounted with cover

slip by DPX. Biopsies sent from surgical department were grossed, processed and wax blocks prepared. Sections were taken from it and stained with hematoxylin and eosin.

FNAC findings have been concluded with different categories of diagnosis according to national cancer institute (NCI) guidelines<sup>[13]</sup>: benign, atypical, suspicious for malignancy, malignant and other nonneoplastic pathology. Subsequent histopathology findings were retrieved.

## Results

Total 244 cases in which FNAC performed and subsequent biopsy received were taken for analysis. Table 1 shows age and sex wise distribution of these breast lump cases.

In our study out of 244, 4 were males (1.64%) and 240 were females (98.36%). Maximum cases of breast lump were in the 21-30 years age group.

Out of total 244 cases 154(63.11%) were benign, 50(20.49%) cases were malignant, 08 (3.27%) were suspicious for malignancy and 32(13.11%) were other nonneoplastic.

In our study 154 cases were diagnosed as benign on cytology. Out of which 142 were fibroadenomas, 7 were fibrocystic disease, 2 were tubular adenoma, 2 were lactating adenoma and 1 was chronic non specific inflammation on histopathology. On FNAC reports, 50 cases were malignant.

On histopathology out of 50, 44 were infiltrating ductal carcinoma, 02 were infiltrating lobular carcinoma, 02 were medullary carcinoma and 2 were ductal carcinoma in situ. Eight cases were suspicious for malignancy, out of which 4 were infiltrating ductal carcinoma, 1 was ductal carcinoma in situ, 1 was mucinous carcinoma and 2 were sclerosing adenosis on histopathology. On other non neoplastic cases, 1 galactocele case was malignant on biopsy.

In confirmed benign and malignant reports on cytology subsequent histopathology reports were consistent in all cases. Out of 8 suspicious for malignancy reports on cytology two turned out to be sclerosing adenosis (benign). Out of total 244 cases, 241 were consistent on histopathology and 3 were inconsistent.

The chi square statistic is 3.0844. The p-value is 0.79047. It is significant at  $p < 0.10$  but it is not significant at  $p < 0.05$ . So, FNAC is not the gold standard for diagnosing breast lump and it should be followed by biopsy in inconclusive results.

Positive cases on statistics are malignant cases or suspicious for malignancy cases (58) and negative cases were benign cases and other cases (186). So our study have Sensitivity, Specificity, Positive predictive value, Negative predictive value, and Efficiency to be 98.24%, 98.93%, 96.55%, 99.46% and 98.77% respectively.

**Table 1: Age and sex distribution of breast lump cases.**

Age (years)	Males	Males (%)	Females	Females(%)
11-20	0	0	40	16.66
21-30	1	25	84	35
31-40	1	25	48	20
41-50	0	0	28	11.66
51-60	1	25	18	7.5
61-70	0	0	16	6.66
71-80	1	25	04	1.66
81-90	0	0	02	0.83
Total	4	100	240	100

**Table 2: Cytological diagnosis**

Cytological diagnosis	Number of cases	Percentage
Benign	154	63.11
Malignant	50	20.49
Suspicious for malignancy	08	3.27
Other (non neoplastic)		
Inflammatory	06	2.45
Fibrocystic	08	3.27
Galactocele	06	2.45
Gynecomastia	04	1.63
Nonspecific	08	3.27
<b>Total</b>	<b>244</b>	<b>100</b>

**Table 3: Cytological and histopathological correlation.**

Cytology	Number	Fibroadenoma	Scle. adenosis	Tubu. adenoma	IDC	ILC	DCIS	Mucinous ca	Medullary ca	Lacta. adenoma	Gynecomastia	Fibro. Breast d.	Granulomatous ma.	Chr.non specific	Total
Benign	154	142	00	02	00	00	00	00	00	02	00	07	00	01	<b>154</b>
Malignant	50	00	00	00	44	02	02	00	02	00	00	00	00	00	<b>50</b>
Suspicious	08	00	02	00	04	00	01	01	00	00	00	00	00	00	<b>08</b>
Inflammatory	06	04	00	00	00	00	00	00	00	00	00	02	00	00	<b>06</b>
Fibrocystic	08	00	00	00	00	00	00	00	00	00	00	08	00	00	<b>08</b>
Galactocele	06	00	00	00	01	00	00	00	00	00	00	00	01	04	<b>06</b>
Gynecomastia	04	00	00	00	00	00	00	00	00	00	04	00	00	00	<b>04</b>
Non specific	08	00	00	00	00	00	00	00	00	00	00	00	01	07	<b>08</b>
<b>Total</b>	<b>244</b>	<b>146</b>	<b>02</b>	<b>02</b>	<b>49</b>	<b>02</b>	<b>03</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>04</b>	<b>17</b>	<b>02</b>	<b>12</b>	<b>244</b>

\*Scle.=sclerosing, tubu.=tubular, IDC=infiltrating ductal carcinoma, ILC=infiltrating lobular carcinoma, DCIS=ductal carcinoma in situ, ca=carcinoma, Lacta.=lactating, Fibro.=fibrocystic, ma.=mastitis, chr.=chronic

**Table 4: Cyto histopathological comparision.**

Cytology diagnosis	Number of cases	Histopathology diagnosis		
		Consistent	Inconsistent	Total
Benign	154	154(100%)	00(00%)	154
Malignant	50	50(100%)	00(00%)	50
Suspicious of malignancy	08	06(75%)	02(25%)	08
Other	32	31(96.87%)	01(3.13%)	32
<b>Total</b>	<b>244</b>	<b>241(98.77%)</b>	<b>03(1.23%)</b>	<b>244</b>

**Table 5: benign and malignant cases on cytology and histopathology.**

	Benign (histopathology)	Malignant(histopathology)	Total
Benign(cytology)	185	1	186
Malignant (cytology)	56	2	58
<b>Total</b>	<b>241</b>	<b>3</b>	<b>244</b>

**Table 6: Cytological diagnosis compared with previous published studies.**

Author	Inadequate	Benign	Suspicious for malignant	Malignant	Other	Total
Debra et al <sup>[14]</sup>	230(13.69%)	1019(60.65%)	300(17.85%)	131(7.79%)	0	<b>1680</b>
Feichter G et al <sup>[16]</sup>	239(16.23%)	1003(68.13%)	49(3.32%)	181(12.29%)	0	<b>1472</b>
Desouza rocha P et al <sup>[17]</sup>	9(1.07%)	640(76.46%)	26(3.10%)	99(11.83%)	63(7.52%)	<b>837</b>
Singh K et al <sup>[18]</sup>	0	200(83.33%)	5(2.08%)	35(14.58%)	0	<b>240</b>
Mohammad Q et al <sup>[15]</sup>	16(13.79%)	68(58.62%)	0	32(27.58%)	0	<b>116</b>
Bukhari et al <sup>[19]</sup>	0	271(63.76%)	32(7.52%)	120(28.23%)	2(0.47%)	<b>425</b>
Shrestha et al <sup>[20]</sup>	27(1.92%)	618(44.04%)	175(12.47%)	152(10.83%)	431(30.01%)	<b>1403</b>
Rupom TU et al <sup>[21]</sup>	3(0.57%)	431(82.25%)	17(3.24%)	72(13.74%)	4(0.76%)	<b>524</b>
<b>Our study</b>	<b>0</b>	<b>154(63.11%)</b>	<b>8(3.27%)</b>	<b>50(20.49%)</b>	<b>32(13.11%)</b>	<b>244</b>

**Table 7: Comparison of accuracy on FNAC**

Author	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Efficiency
Kline TS et al <sup>[22]</sup>	89.5	92.5	85.33	-	91.63
Dominguez F et al <sup>[23]</sup>	93.49	95.73	93.49	95.73	98.75
Feichter et al <sup>[16]</sup>	86	99.3	99.3	85	93
Desouza rocha P et al <sup>[17]</sup>	93.8	98.21	92.7	-	97.40
Singh A et al <sup>[24]</sup>	84.6	100	-	-	92.3
Khemka A et al <sup>[25]</sup>	96	100	100	95.12	-
Bukhari et al <sup>[19]</sup>	98	100	97	100	98
Muhamed et al <sup>[26]</sup>	90.6	100	100	99	-
Rubin et al <sup>[27]</sup>	87	100	100	89	-
Ishikawa et al <sup>[28]</sup>	86.3	98.2	97.9	-	-
Collaco et al <sup>[29]</sup>	92.1	98.1	99.4	98.1	-
Jan et al <sup>[06]</sup>	92.6	98.48	-	-	-
Our study	98.24	98.93	96.55	99.46	98.77

## Discussion

Fine needle aspiration cytology is globally recognized method as initial investigation and screening of breast lump. In our study fibroadenoma was commonest benign lesion and infiltrating duct carcinoma was commonest malignant lesion. These results are comparable with Debra et al<sup>[14]</sup> and Mohammad Q et al<sup>[15]</sup>.

Our study have 63.11% benign, 3.27% suspicious for malignancy, 20.49% malignant and 13.11% other nonneoplastic cases on FNA cytology reports. These results have been compared with other previous studies in above table.

Table 7 shows comparison of statistical values of our study with various other previously published studies.

A single case of galactocele was given on FNAC on the basis of aspiration and cytology findings. Patient was 40 years old and was having 6 month old child. 0.5 ml whitish fluid was aspirated on FNAC with 23G needle and 10 ml syringe. On ultrasonography finding, it was irregular hypoechoic mass lesion. So, biopsy was advised. Infiltrating ductal carcinoma was given on subsequent biopsy.

Two cases were suspicious for malignancy on FNACs. One case was 38 years and other 46 years old. On palpation, it was hard, fixed and nonmobile swelling. On cytology, cellular pleomorphism and high nuclear to cytoplasmic ratio was present in few cells. So it was concluded as suspicious on FNAC. Biopsy was advised. On biopsy, it was sclerosis adenosis in both cases.

## Conclusion

The fine needle aspiration cytology of breast lump is easy, valuable, cost effective, time saving and worldwide recognized method for initial investigation and screening of breast lump. It helps the surgeon on further management of lump as it is sensitive and specific. FNAC results should be correlated with clinical findings and radiological investigations. Inconclusive results on FNAC should always be confirmed with subsequent biopsy as histopathology is currently gold standard for diagnosis.

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**\*Corresponding author:**

**Dr. Ankur N Sarvaiya**, Assistant professor, dept. of pathology, GMERS Medical College, Himmatnagar. Gujarat, India

**Phone:** +91 9974149292

**Email:** ankur.sarvaiya@gmail.com

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