

Correlation between Fine Needle Aspiration Cytology and Histopathology of Various Breast Lesions: A Tertiary Care Hospital Based StudyMoxa Parmar¹, Rushikesh Surani², Reeti Pokar³, Parita Patel⁴^{1,3}Senior Resident, Department of Pathology, GMERS Medical College, Himmatnagar, Gujarat, India²Senior Resident, Department of Obstetrics & Gynecology, GMERS Medical College, Himmatnagar, Gujarat, India⁴Senior Resident, Department of Pathology, Pacific Medical College and Hospital, Udaipur, Rajasthan, India

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Abstract:

Background: Cancer of breast is a second most common cause of cancer in women. Increase in cases of breast cancer is related to late marriage, birth of child in the later age, shorter period of breast feeding and nulliparity or low parity. Clinical examination in conjunction with fine needle aspiration cytology and mammography also known as 'Triple Approach' can divide almost all breast lesions preoperatively into benign and malignant categories. Many a times however, Aspiration cytology diagnosis can be substituted for biopsy diagnosis. It is therefore, very important to evaluate the efficacy of FNAC, which can be done by correlating cytological findings with histopathological diagnosis

Methods: This study comprises of fine needle aspiration cytology and its histopathological correlation in 40 cases of breast lesions. In patient having lump in breast FNAC was carried out in cytology, followed by histopathology was carried out in histopathology laboratory.

Results: The benign tumors was most common and diagnosed with more accuracy followed by malignant tumors. Amongst the benign tumours, most common lesion was fibroadenoma. Amongst the malignant tumours, most common was invasive ductal carcinoma.

Some inconsistent findings were observed mainly in atypical ductal hyperplasia versus chronic mastitis. Final diagnosis was confirmed by histopathology.

Conclusions: Total 40 cases of various breast lesions were studied at tertiary care hospital by fine needle aspiration cytology and histopathology. Out of 40 cases the cyto-diagnosis were compatible with histology in 39 cases, 1 was incompatible with histopathological diagnosis. So, over all sensitivity was 97.3%, specificity 100%, positive predictive value 100%, negative predictive value 66.6%.

Keywords: FNAC, Fibroadenoma, Invasive Ductal Carcinoma.

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Introduction

Cancer of breast is a second most common cause of cancer in women. Increase in cases of breast cancer is related to late marriage, birth of child in the later age, shorter period of breast feeding and nulliparity or low parity. [1] With growing awareness in the general population especially about breast, a lady with a breast lump is one of the commonest presentations. Examination would be followed in most patients with a confirmatory diagnosis under microscope. In India, the age adjusted incidence of breast cancer seen in various population-based registries indicates that in urban areas it ranges between 20-30 per 1,00,000 persons. [2] Clinical examination in conjunction with fine needle aspiration cytology and mammography also known as 'Triple Approach' can divide almost all breast lesions preoperatively into benign and malignant

categories [3]. In elderly patients, breast lumps are more often malignant and aspiration cytology provides the least traumatic method of diagnosis and may be the only comfortable procedure necessary in patients who need only be treated with hormone therapy [4]. The diagnosis by FNAC may be presumptive in some cases. The final diagnosis in such cases is achieved by histopathological examination of the tissue removed surgically [5]. Therefore, FNAC should not replace clinical judgement or exclude indicated tissue biopsy. Many a times however, Aspiration cytology diagnosis can be substituted for biopsy diagnosis. It is therefore, very important to evaluate the efficacy of FNAC, which can be done by correlating cytological findings with histopathological diagnosis.6. The present study was aimed to

evaluate the efficacy of FNAC by correlating it with histopathological features in breast lesions.

Methods

This study comprises of fine needle aspiration cytology and its histopathological correlation in 40 cases of breast lesions. In patient having lump in breast FNAC was carried out in cytology, followed by histopathology was carried out in histopathology laboratory.

Female patients with age of > 20 years with palpable Breast lump were included.

Patients who are below 20 years, Female patients with advanced disease which makes the diagnosis obvious, Patients do not undergo lumpectomy

The aspiration was carried out with 22–23gauge needle to aspirate the breast lump, without local anaesthesia. Usually, no complications were seen after aspiration.

Before FNAC, detail history of patient was taken and local examinations of masses were performed,

prior to procedure, the whole procedure was explained to patient with their consent. Aspiration was done and material was released on glass slides, smears were prepared and immediately fixed with methyl alcohol. After fixation of slides stained by H&E stain and Papanicolaou stain.

The patients with benign and inconclusive lesions underwent an excision biopsy and the patients with report as malignancy were subjected to modified radical mastectomy, the excision biopsy and mastectomy specimens were subjected to histopathology examination and the results were recorded and compared to the results of the Modified triple test.

Results

A prospective study of fine needle aspiration cytology of palpable breast lump was carried out with their histology correlation. In 40 cases of breast lumps cytology and histology correlation carried out.

Table 1: Lesions in breast cytology smear (n=40cases)

Lesions	No.	Percentage (%)
Acute mastitis	04	10%
Benign breast disease	03	7.5%
Fibrocystic breast disease	04	10%
Gynecomastia	01	2.5%
Fibroadenoma	13	32.5%
Atypical ductal hyperplasia	05	12.5%
Suspicious of malignancy	03	7.5%
Ductal carcinoma	07	17.5%
Total	40	100%

From above table, fibroadenoma aspiration was common (32.5%), followed by ductal carcinoma (17.5%) Atypical ductal hyperplasia (12.5%) and fibrocystic breast disease (10%).

Table 2: Cytological finding in general in breast smear (n = 40 cases)

Cytological diagnosis	No. of cases	Percentage (%)
Benign	25	62.5%
Malignant	07	17.5%
Suspicious	03	7.5%
Atypical ductal hyperplasia	05	12.5%
Total	40	100%

In present study benign lesions were commonest (62.5%) followed by malignant lesions (17.5%). (Benign lesions include inflammatory, benign breast disease, fibrocystic breast disease, fibroadenoma, and gynecomastia.)

Table 3: Histopathology of breast lesions (n= 40 cases)

Histopathological diagnosis	No. Of cases	Percentage (%)
Acute mastitis	03	7.5%
Chronic granulomatous mastitis	02	05%
Sclerosing adenosis	01	2.5%
Fibro adenosis	02	05%
Fibroadenoma	14	35%
Gynecomastia	01	2.5%

IDC-NOS Type	09	22.5%
IDC with medullary features	01	2.5%
Mucinous carcinoma	01	2.5%
Invasive lobular carcinoma	02	05%
Phyllode tumor	01	2.5%
Other benign lesion	03	7.5%
Total	40	100%

In present study benign lesion, fibroadenoma was more common (35%). In malignant lesion invasive ductal carcinoma (22.5%) was more common followed by invasive lobular carcinoma (05%).

Table 4: Analysis of cases with Inconsistent cytological and histological diagnosis

Cyodiagnosis	No. of cases with Inconsistent diagnosis	Histopathological diagnosis
Acute mastitis	01	Chronic granulomatous mastitis
Suspicious of ductal carcinoma	01	Sclerosing adenosis
Acute mastitis	01	Xanthogranulomatous mastitis
Total	03	

Table 5: Cytological and histopathological correlation in general of breast lesions (n= 40 cases).

Cyodiagnosis	No. of cases (%)	Histological correlation		
		Compatible	Incompatible	
			False positive	False negative
Malignant	07	07	00	00
Benign	25	25	00	00
Atypical	05	05	00	00
Suspicious of malignant	03	02	00	01
Total	40	39	00	01

All benign and malignant lesions were correlated, in suspicious of malignancy lesions 1 was benign on histopathology.

Table 6: Sensitivity and specificity of present study

FNAC	Histopathology		
	Benign	Malignant	Total
Benign	30	00	30
Suspicious of Malignant	01	02	03
Malignant	00	07	07
Total			40

(Benign lesions include inflammatory, benign, and atypical)

Table 7: Statistical analysis

Statistical indices	TP	TN	FP	FN	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
	37	02	00	01	97.3%	100%	100%	66.6%

Discussion

A lump in the breast is a common complain presenting in the surgical out – patient department of all major hospitals, with anxiety regarding a possible malignancy being extremely common. Hence a quick diagnosis of a lump in the breast is essential. Criteria such as cost effectiveness, use of anaesthesia, time between the diagnostic procedure and report, patients' hospital stay and most importantly, reliability in deciding subsequent

treatment, are all factors to be taken into account in this regard. Considering patients' comfort, lack of requirement of anaesthesia, rapid analysis and reporting, and an absence of false positive results makes FNAC an ideal initial diagnostic modality in breast lumps.

The expansion of FNAC in the primary diagnosis of cancer in the last 30 years has been enormous and hugely successful.

Table 8: Comparison of cytological finding in general with other studies

Cytological Diagnosis	Chauhan et al [12] (%)	S. Upadhyay [11] (%)	Present study (%)
Benign	63.11	44.91	62.5
Malignant	22.49	16.67	17.5
Suspicious	3.27	6.06	7.5
Atypical ductal hyperplasia	-	-	12.5

In present study benign lesions were 62.5%, malignant 17.5%, which was comparable to other studies Chauhan et al [12] & S. Upadhyay [11] and suspicious lesions were 7.5%, which was comparable to other studies.

Table 9: Cytology and histology Correlation of breast lesions with other studies.

Study	No. Of cases	Benign		Malignant		Suspicious		Unsatisfactory	
		No.	%	No.	%	No.	%	No.	%
Choi et al [7]	1297	981	95.63	182	14.03	38	2.92	96	7.40
Tiwari [1]	91	84	92.30	06	6.59	01	1.09	00	00
Zangana [8]	211	108	52.80	56	26.6	28	12.6	19	08
Present study	40	30	75	07	17.5	03	7.5	00	00

In present study benign lesions were 75%, malignant 17.5% and suspicious 7.5% which was comparable to other studies.

Table 10: Comparison of various details and statistical analysis of present study with other studies

Study	No. Of cases	Sensitivity	Specificity	PPV	NPV
Krishnamurthy(1987) [9]	969	96%	100%	100%	89.57%
Zarbo et al(1991) [10]	13066	97%	97%	95%	96%
Chauhan et al [12] (2017)	244	98.24%	98.93%	96.55%	99.46%
Present study	40	97.3%	100%	100%	66.6%

In present study sensitivity 97.3%, specificity 100%, positive predictive value 100%, that was in accordance with other studies. Negative predictive value is 66.6%, which is low in our study.

Conclusion

Total 40 cases of various breast lesions were studied at tertiary care hospital by fine needle aspiration cytology and histopathology. Out of 40 cases the cytodiagnosis were compatible with histology in 39 cases, 1 was incompatible with histopathological diagnosis. So, over all sensitivity was 97.3%, specificity 100%, positive predictive value 100%, negative predictive value 66.6%.

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