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CORRELATION OF FNAC AND HISTOPATHOLOGY IN THE EVALUATION OF BREAST LUMP

Pathology

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ABSTRACT

INTRODUCTION: FNAC is a quick-to-perform, easy, out-patient and virtually painless procedure which became a standard tool for diagnosis in breast lumps.

AIMS AND OBJECTIVES: 1) To correlate FNAC and surgical Pathology in evaluation of breast lump.
2) To assess diagnostic accuracy of FNAC and Surgical Pathology of breast lump.

METHOD: This study was performed in retrospective and prospective manner, on Patients presenting with breast lump in the Department of Pathology, Government Medical College and Hospital and Government cancer hospital, Aurangabad during the period of July 2014 to October 2017.All patients with unknown primary diagnosis of breast lump are enrolled for study.

RESULT: Out of 47 cases, 40 cases was correlated on FNAC and histopathology examination. In 40 correlated cases, 37 (91.5%) cases were malignant and 3 (8.5%) cases were benign breast lesion.
Our study shows, In 7 discordant cases.

CONCLUSION: FNAC is important preliminary diagnostic test in palpable breast lumps, and done by expert hands, the results show a high degree of correlation with the final histopathology report.

KEYWORDS

Breast lump, FNAC, istopathology.

INTRODUCTION

Breast carcinoma is a heterogenous disease, with wide variation in clinical behaviour.[1] 1.38 million individuals worldwide are affected every year.[2] A correct pathological diagnosis is the most important part in the management and determining the prognosis of the disease[3].
Fine needle aspiration cytology (FNAC) is an important initial diagnostic modality in breast lumps as there is no need for anesthesia and rapid analysis and reporting can be done with few false positive results.[4] Fine Needle Aspiration Cytology (FNAC) is a relevant and important method to diagnose breast cancer, but technical problems such as limited cellularity, excessive air drying and/or artifactual mechanical disaggregation can potentially limit the interpretation, as well as contribute to a false-negative or a false-positive diagnosis of malignancy.[5] Surgical biopsy of palpable breast lump was considered the gold standard for the diagnosis of breast lump(s). Emphasis has been placed on improving method for establishing a definitive diagnosis of breast mass prior to surgery.[6]

MATERIALS & METHOD

Our study was performed in retrospective and prospective manner, All patients with unknown primary diagnosis of breast lump are enrolled for study. A complete evaluation of patients with breast lump was done, including the clinical details and various investigations (hematological, radiological, cytological and histopathological)

Statistical Analysis:

Reports of FNAC were correlated with the definitive histopathological diagnosis.The sensitivity, specificity, positive and negative predictive value rates of cytological diagnosis were evaluated on the basis of histopathological diagnosis.

RESULTS

In the present study, carried out over period of July 2014 to October 2017, 47 cases of breast lump that had undergone FNAC and surgical pathology were enrolled. Histopathological examination of all cases were done and correlated with cytology diagnosis. Following observations were made.

Table 1: Distribution of cytology diagnosis of breast lump (n=47)

Diagnostic category	Diagnosis	Cytology (n=47)	Percentage %
Unsatisfactory	Inadequate	2	4.2
Benign breast lesion	Fibroadenoma	3	6.4
	Benign phyllodes tumor		
	FCD	1	2.1
	Proliferative breast lesion	3	6.4
Undeterminant	Atypical duct hyperplasia		2
Malignant	Suspicious of malignancy	12	vc
	Suggestive of malignancy — IDC	23	48.9
	Mucinous carcinoma	1	2.1
Total		47	100

In our study,

Out of 47 cases, 23 (48.9%) cases diagnosed as suggestive of malignancy, 12 (25.6%) cases were suspicious of malignancy, 3 (6.4%) cases were diagnosed as proliferative breast lesion without atypia, 2 (4.3%) cases as fibroadenoma, 1(2.1%) case was diagnosed as mucinous carcinoma of breast.

Table 2: Result of FNAC (n=47)

	Benign	Malignant	Inadequate	Total
No of cases	8	37	2	47
Percentage	(17.0%)	(78.7%)	(4.3%)	(100%)

In present study out of 47 cases, 8 (17.0%) cases diagnosed as benign, 37 (78.7%) cases was malignant and 2 (4.3%) cases was non conclusive on FNAC.

Table 3: Histopathological distribution of breast lesions (n=47)

Diagnostic category	Histopathology Diagnosis	(n=47)	Percentage %
Benign breast lesion	Benign phyllodes tumor	1	2.1
	FCD	2	4.3
	Proliferative breast lesion	1	2.1
Malignant	IDC	42	89.4
	Mucinous carcinoma	1	2.1
Total		47	100

On histopathology examination, out of 47 cases 42(89.4%) cases diagnosed as IDC (infiltrating duct carcinoma), 1(2.1%) case was diagnosed as mucinous carcinoma of breast, 1(2.1%) case was diagnosed as benign phyllodes lesion, 2(4.3%) cases as FCD (fibrocystic disease) and 1(2.1%) case was diagnosed as proliferative breast disease

Table 4: Result of Histopathology (n=47)

	Benign	Malignant	Total
No of cases	4	43	47
Percentage (%)	8.5	91.5	100

In present study,

All 47 cases broadly divided into benign and malignant lesion so, out of 47 cases, 43 (91.5%) cases diagnosed as malignant, 4 (8.5%) diagnosed as benign on histopathology.

Table 5: Statistical analysis for FNAC of Breast lump (n=47) Histopathology

Diagnosis	Malignant	Benign	Total
Malignant	37	0	37
Benign	4	4	8
Total	41	4	45

Out of 47 cases, 2 cases were inadequate so, that cases not included in statistical analysis.

So, FNAC shows,
- Sensitivity = 88.09%
- Specificity = 100%
- Positive predictive value = 100%
- Negative predictive value = 50%
- Accuracy = 91.1%

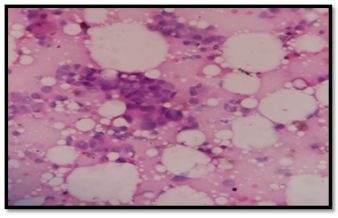

Fig. 1a: Photomicrograph of FNAC, moderately cellular smear showing small groups and singly scattered of ductal epithelial cells, having large, hyperchromatic, pleomorphic nucleus, and fuidic background.(H&E x 400)

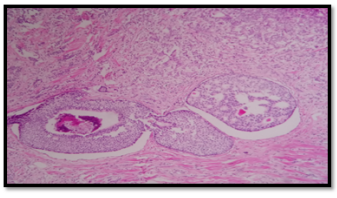

Fig. 1b: Photomicrograph showing Histopathology of IDC (grade II) with ca in situ mixed type.(H&E x 200)

DISCUSSION

The present study carried out over period of July 2014 to October 2017, included total 47 cases having breast lump and undergone FNAC and histopathology were selected for correlation between their FNAC and histopathology report.

The results of the study were compared with similar studies in India and abroad.

Table 6: Distribution of Cytological diagnosis (n=47)

Category	Tomoko et al (2011)7(%)	Present study (%)
Inadequate or normal	16	4.2
Benign	2	14.9
Indeterminate	14	4.3
Suspicious of malignancy	26	25.5
Malignancy	42	51.1

In present study 25.5% cases diagnosed as suspicious of malignancy which was same as a study by Tomoko et al (2011)7, in which 26% cases diagnosed as suspicious of malignancy. Inadequate sample in our study was only 4.2%.

Table 7: Cytology and histopathological correlation (n=40)

Diagnosis		Number of correlated cases on cytology and histopathology Percentage (%)
Benign breast lesion	Fibroadenoma	8.5
	Benign phyllodes tumor	
	Fibrocystic disease	
Undeterminant		0
Malignant	Suspicious	91.5
	Suggestive	
Total		100

Out of 47 cases, 40 cases was correlated on FNAC and histopathology examination. In 40 correlated cases, 37 (91.5%) cases were malignant and 3 (8.5%) cases were benign breast lesion.

Our study shows, 7 discordant casesThe discrepancy of diagnosis on cytology and histopathology was due to failure of hitting the target site of tumor by Fnac.

Varsha et al (2017)[8] shows 2 false negative cases, in their study of patients for FNAC breast with subsequent histological correlation reported similar reasons for cytohistological discrepancy in the false negative category.

Table 8: Breast lesions diagnosed by cytology and its comparison with histopathology diagnosis (n=45)

Cytology diagnosis	Total no. of cases	Histopathology diagnosis	No of cases	Remark
Benign breast lesion	8	Fibroadenoma	0	True negative
		Benign phyllodes tumor	1	
		FCD	2	
		proliferative breast lesion	1	
		Malignant (IDC)	4	False negative
Suspicious or suggestive of malignancy	37	Fibroadenoma/benign phyllodes tumor/ FCD/ proliferative breast lesion	0	False positive
		IDC	36	True positive
		Mucinous carcinoma	1	

Out of 47 cases, total 8 cases were diagnosed as benign breast lesion on FNAC. On histopathology examination 1 case diagnosed as benign phyllodes tumor, 2 cases FCD, 1 case diagnosed as proliferative breast lesion, these cases i.e. 4 cases were considered as true negative.

However 4 malignant cases, i.e. 4 IDC case were considered as false negative.

Out of 47 cases 37 cases diagnosed as suspicious or suggestive of malignancy on FNAC. On histopathology none of the case diagnosed as benign breast lesion, considered as false positive (false positive= 0), however 36 cases diagnosed as IDC and 1 case mucinous carcinoma of breast were considered as true positive.

Table 9: Statistical analysis of FNAC

Modality	Khemka A et al(2009)[12] (%)	Abhijit S et al (2016)[5](%)	Present study (%)
Sensitivity (%)	96	69	88.09
Specificity (%)	100	100	100
Positive predictive value (%)	100	100	100
Negative predictive value (%)	95.1	38.1	50
Accuracy (%)	-	74.0	91.1

In our study, sensitivity for breast carcinoma of FNAC was 88.09%, specificity and positive predictive values were 100% each, negative predictive value was 50%, and accuracy was 91.1%.

Our observations were similar to a study by **Abhijit S et al (2016)**[5] they noted 69% sensitivity of FNAC, specificity and positive predictive values for breast carcinoma were 100% each, similar to our study. Negative predictive value and accuracy were 38.1% and 74% respectively.

findings of a study by **Khemka et al (2009)**[9] were having some variability for all modalities.

CONCLUSION

Since breast is superficial in location and easily accessible, FNAC is very safe, accurate, repeatable preoperative screening and diagnostic

procedures.

FNAC should be a part of routine practice initial evaluation of breast lump as it is least invasive and cost effective procedure for the diagnosis of breast lump.

However, the clinician should correlate FNA cytological results with physical examination and imaging findings to prevent false negative and false positive events and to obtain optimal management for their patients.

The FNAC in a breast lump using histopathology as gold standard showed a sensitivity 88.09%, specificity 100% ,Accuracy 89.13%.

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