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Efficacy of FNAC in Diagnosis of Breast Lumps - A Retrospective Study

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ABSTRACT

Background: FNAC is an established and highly accurate method for diagnosis of breast lesions. Its further advantage is to give rapid diagnosis, cost-effectiveness, excellent patient acceptance and minimal or no morbidity. The study aimed to diagnose various breast masses before operation by FNAC and to compare the result of FNAC with histopathological study to assess the efficacy of FNAC.

Materials and Methods: The study entitled "Efficacy of FNAC in diagnosis of Breast Lumps" is a retrospective study conducted in department of surgery with collaboration of pathology department at Nalanda Medical College and Hospital, Patna during the period of July 2017 to December 2019. During this period, 150 FNAC cases were selected for study.

Results: Fibroadenoma was the most commonly diagnosed entity in benign breast lesions, followed by fibrocystic disease. Among malignant lesions, infiltrating ductal carcinoma was the most common. The overall diagnostic accuracy of FNAC in benign breast lesions was 94.59%. The fibroadenomas were correctly diagnosed in 92.96% cases. There were 5.41% false negative results in our series. There was no false positive result giving specificity of 100%.

Conclusion: FNAC is an inexpensive, simple, safe and readily acceptable procedure to the patient and plays main role to provide rapid and accurate diagnosis of breast lumps. FNAC enables us to differentiate benign from malignant lesions with high sensitivity, specificity and diagnostic accuracy.

Keywords: Breast Lump, FNAC, HPE: Histopathological Examination.

INTRODUCTION

Fine needle aspiration cytology (FNAC) of breast was first used in the 1930s by Martin & Ellis and by Stewart at Memorial Hospital [1,2,3], followed in the late 1940s and early 1950s by Adair [4] and Godwin [5]. Breast lump is a matter of worry to patient as well as clinician, hence need of reliable and quick method for correct diagnosis.

FNAC is an established and highly accurate method for diagnosis of breast lesions. Its further advantage is to give rapid diagnosis, cost-effectiveness, excellent patient acceptance and minimal or no morbidity [6]. The use of core biopsy (CB) is being increasingly advertised but its procedure is more cumbersome, expensive and time consuming as compared to FNA procedure [7,8,9] Core biopsy or Trucut needle biopsy is not widely used because of its complications, interpretation and time consuming result; therefore palpable breast lesions can be accurately diagnosed by triple test only i.e. physical examination, mammography and FNAC [10].

FNAC of breast has average sensitivity of 87%, specificity of 98-100%, negative predictive value of 87-99% and the efficiency of 89-99% [11,12,13]. False positive results in the literature are reported to be approximately 4% [14].

In an effort to diagnose various breast masses before operation, we conducted a retrospective study to assess the accuracy of FNAC and compared the result with histopathological study.

MATERIALS AND METHODS

A retrospective study was conducted in department of surgery with collaboration of pathology department at Nalanda Medical College and Hospital, Patna during the period of July 2017 to December 2019. During this period, 150 FNAC cases were selected for study.

FNAC was done by the cytopathologists using a 23 gauge needle attached to a 10 ml syringe with proper aseptic precautions without local anaesthesia. Material spread on glass slide was wet fixed in 95% methanol and was air dried for staining with two stains Haematoxylin and Eosin (H & E) and Papanicolaou(Pap) stains.

Slides were examined under microscope by cytopathologists and were interpreted as benign/ suspicious of malignancy / malignant tissues present / inadequate or unsatisfactory.

The benign lesions were further categorized using the morphologic criteria described by Zajicek (1974) [14] into fibroadenoma, mammary dysplasia, galactocele, granulomatous, cystosarcoma phylloides (benign), duct hyperplasia, fat necrosis and mastitis.

A diagnosis of fibroadenoma was made where monolayered sheets of ductular epithelial cells were seen. Cells showed round to oval nuclei with coarse chromatin and many bipolar naked nuclei in background. Fibroadenosis was diagnosed when sheets of duct epithelial cells showed mild pleomorphism, foam cells and porcine cells.

'Suspicious of malignancy' report was given in cases where cytologic findings were highly suggestive but malignancy was not confirmed. Reports with 'malignant tissues present' were given where definite malignant cells were recognized. Cases in which none or very few cells were obtained were reported as 'inadequate' or 'unsatisfactory'.

All cases with FNAC report showing benign breast lesions except mastitis and breast abscess were operated as open excisional biopsy. Cases with malignant report were subjected to modified radical or simple mastectomy. Breast lumps reported as 'suspicious of malignancy' were subjected to lumpectomy with 2 cm clear margin all around the lump. Tissues removed in all cases were subjected to histopathological examination. The histopathological findings were correlated with those of FNAC.

RESULT

A total of 150 patients with breast lump were subjected to FNAC during the period of July 2017 to December 2019. Satisfactory aspirates were available in 142 cases (94.66 %). Out of 142 satisfactory aspirates, 119 (83.8 %) were reported as benign breast lesions, 17 (11.97 %) as malignant breast lesions, 6 (4.22 %) as suspicious of malignancy. Rest 8 (5.33 %) cases were reported as unsatisfactory. Among 119 cytologically benign breast lesions, HPE was done in 112 cases, in which 106 cases proved to be benign and 6 cases malignant. All 17 cytologically malignant cases were subjected to histopathological examination and all were proved to be malignant. Among 6 suspicious cases, 5 cases were put to histopathological examination, 1 was proved to be benign whereas 4 malignant. Among unsatisfactory aspirates, 6 put to histopathological examination, 5 were found to be benign and 1 malignant. Table I shows the cytological diagnosis of these along with the histological correlation.

Among 119 cytologically diagnosed benign breast lesions, fibroadenoma accounted for 71 cases, fybrocystic disease 24, galactocele 3, granulomatous lesions 1, benign phylloides 2, duct hyperplasia 4, acute nonspecific mastits 3, breast abscesses 4, fat necrosis 1 and benign breast lesions

without a specific diagnosis in 6 cases.

TABLE I: Cyto-histological correlation of all breast lesions

		Histological Diagnosis		
Cytological Diagnosis	**No of cases**	**Histology available**	**Benign Breast lesions**	**Malignant Breast lesions**
Benign Breast lesions	119	111	105	6
Malignant Breast lesions	17	17	0	17
Suspicious	6	5	1	4
Unsatisfactory	8	6	5	1
Total	150	139	111	28

Out of 71 cytologically diagnosed fibroadenomas, 66 cases were diagnosed as fibroadenoma, 3 as fibrocystic disease, 1 as cystosarcoma phylloides (benign) and 1 proved to be malignant on histopathological examination. Out of 24 cytologically diagnosed fibrocystic disease, 4 proved to be fibroadenoma, 18 fibrocystic disease and 2 proved to be malignant on histopathological examination. Details of cyto-histological correlation are summarized in Table II.

TABLE II: Cyto-histological correlation of benign lesions

Cytological Diagnosis		**Histological Diagnosis**						
	No of cases	**Fibro adenoma**	**Fibrocystic disease**	**Cystosarcoma Phylloides (benign)**	**Granulomatous**	**Duct Papilloma**	**Fat necrosis**	**Malignant**
Fibroadenoma	71	66	3	1	-	-	-	1
Fibrocystic disease	24	4	18	-	-	-	-	2
Galactocele	3	-	-	-	-	2	-	1
Granulomatous	1	-	-	-	1	-	-	-
Cystosarcoma phylloides(benign)	2	-	-	2	-	-	-	-
Duct hyperplasia	4	-	-	-	-	3	-	1
Fat necrosis	1	-	-	-	-	-	1	-
Benign breast lesions without specific diagnosis	6	-	4	-	-	1	-	1
Total	112	70	25	3	1	6	1	6

All malignant lesions were subjected to histopathological examination. Among 17 malignant breast lesions, ductal carcinoma accounted for 15 cases, lobular carcinoma for 1, and metaplastic carcinoma for 1 case. Cyto-histological correlation of malignant lesions are given in Table III.

TABLE III: Cyto-histological correlation of malignant lesions

Cytological Diagnosis		**Histological diagnosis**					
	No. of cases	**Invasive Ductal Ca**	**Tubular Ca**	**Medullary Ca**	**Mucinous Ca**	**Lobular Ca**	**Metaplastic**
Ductal Ca	15	13	1	1	-	-	-
Lobular Ca	1	-	-	-	-	1	-
Metaplastic Ca	1	-	-	-	-	-	1
Total	17	13	1	1	-	1	1

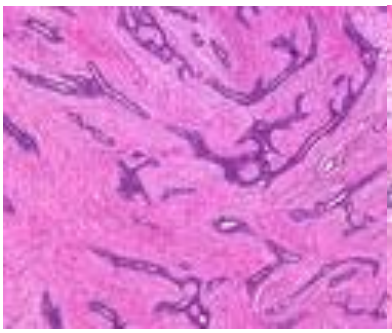

Photo-Microscopic
Fibroadenoma-Intracanalicular

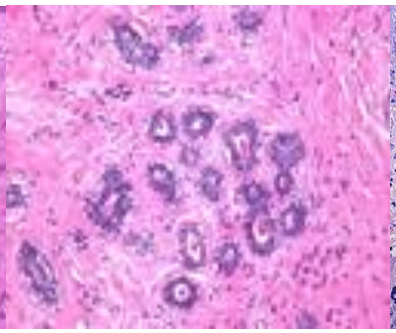

Photo-Microscopic
Fibroadenoma Pericanalicular

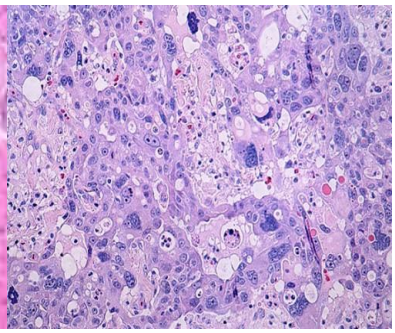

Photo-Microscopic
Invasive ductal carcinoma

DISCUSSION

In the present study, fibroadenoma was the most commonly diagnosed entity in benign breast lesions (N71, 47.33%), followed by fibrocystic disease (N24, 16%). These findings correlated well with other authors [15,16,17]. Among malignant lesions, infiltrating ductal carcinoma was the most common, which correlated well with many authors [15,16,17].

The incidence of benign lesions in the present study were similar to the observation made by Ishita pant et al [16], Rocha et al [18], Ashwin et al [19], whereas the incidence of malignant cases were in comparison with the observation of Y.D. Choi et al [20] as depicted in Table IV.

Table IV

	Rocha18	**(1997) Ishita pant16**	**(2003) Y.D. Choi20**	**(2004) Ashwin19**	**(2015) Present study**
Period	4 Year	1 Year	4 Year	2 Year	2.5 Year
Breast lesions					
Benign	641 (76.58%)	85 (68%)	981 (75.64%)	319 (77.2 %)	119 (79.33 %)
Malignant	99 (11.83%)	25 (20%)	182 (14.03%)	76 (18.4%)	17 (11.86 %)

The overall diagnostic accuracy of FNAC in benign breast lesions was 94.59%. This compares well with the reported series 97.1% [21], 93.66% [22], 97.87% [23], and 94% [24]. The fibroadenomas were correctly diagnosed in 92.96% of 71 histologically documented cases in our series.

There were 6(5.41%) false negative cases in our series. There was no false positive result giving specificity of 100%. False negatives in breast aspirates may be due to sampling error or judgment error. In the hands of experienced cytopathologists the latter should be minimal. A repeat aspirate improves the accuracy in clinically doubtful cases, but not even a succession of negative needle biopsies ensures that a lesion is benign. Excision biopsy should therefore be performed in all clinically doubtful but cytologically negative cases.

CONCLUSION

FNAC is an inexpensive, simple, safe and readily acceptable procedure to patient and plays main role to provide rapid and accurate diagnosis of breast lumps. FNAC enables us to differentiate benign from malignant lesions with high sensitivity, specificity and diagnostic accuracy. Benign and malignant interpretations are highly predictive but must be used only in the context of other diagnostic modalities. Suspicious lesions require further investigation.

Diagnostic errors with subsequent inappropriate clinical decisions can be best avoided if clinician use the Triple diagnostic procedure of clinical examination, mammography/ultrasonography and FNAC which increase the accuracy for diagnosis of breast lesions.

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Ethical Approval: Approved

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