



Fine needle aspiration of palpable breast lesions results obtained with PAP and MGG with histopathological correlation-a hospital based study.

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Abstract

Breast carcinoma is the leading cause of cancer death in women. Most of the time breast carcinoma presents as breast lump. Fine Needle Aspiration Cytology (FNAC) is a convenient and rapid preoperative diagnostic procedure. In this prospective study, FNAC was performed in patients presenting with breast lump and its findings were correlated with histopathological findings. Out of total 200 cases of breast FNAC, 87 cases had histopathology correlation. There were 68 cases (34%) which were labeled as malignant, 8(4%) cases were found to be suspicious or atypical, 101 (50.5%) cases were found to be benign on FNAC and in 23 cases (11.5%) the results were unsatisfactory. All the 87 cases with confirmed diagnosis were in the age group of 16 to 70 years. Breast lumps were most commonly seen in age group 21 to 30 years which comprises of benign lesions. Maximum number of malignancy was seen in age group 41 to 50 years. Out of 87cases, malignancy was seen in 41 cases. The most common carcinoma was Invasive Ductal Carcinoma (IDC) with 37 out of 87 (42.5%) cases. With correlation of FNAC and histopathology, the sensitivity and specificity of both benign and malignant lesions were high. In malignant lesions, the sensitivity and specificity were 97.56% and 97.82% respectively. FNAC is a safe diagnostic procedure in the preoperative diagnosis of breast lumps in our setting. It gives the accurate result with proper technique and interpretation.

Keywords: Benign lesion, fine needle aspiration cytology, histopathology, malignant lesion

Introduction

Diseases of breast, with their uncertain causes and confusion of treatments, have intrigued physicians and medical historians throughout the ages. Benign as well as malignant breast lesions are quite common in Indian population. It is the second most common cancer site after cancer

cervix in Indian females. Currently, 75,000 new cases of breast cancer are detected in India yearly.⁽¹⁾ Clinical and mammographic evidence either alone or in combination do not identify all the malignant conditions. Fine-needle aspiration cytology (FNAC) method was found to be a very

valuable aid in diagnosis of cancer and was introduced as a primary test in the diagnosis of breast carcinoma. The procedure is safe, reliable and time saving outdoor procedure with little discomfort to the patient. FNAC is not only useful in diagnosis and further planning of treatment without need for biopsy, but also helpful in prognostication of the tumor factors such as nuclear grading, mitotic index, hormone receptor status and DNA contents. The slides can be prepared by cytopspin method or thin prep method.⁽²⁾

Aims and Objectives

- 1.To evaluate role of FNAC in the diagnosis of breast lesions using PAP and MGG stains.
2. To find out comparative incidence of various breast lesions .
3. To correlate the incidence of breast lesions with age of the patient and other clinical features.

Observations

Table-1 Showing results of 200 cases of FNAC of lump breast

Serial no.	category	No. of cases	percentage
1	malignant	68	34%
2	Atypical or suspicious	08	04%
3	benign	101	50.5%
4	unsatisfactory	23	11.5%
	total	200	100%

Out of total 200 cases of breast FNAC, there were 68 cases (34%) which were labeled as malignant, 8(4%) cases were found to be suspicious or

Materials and Methods

In this prospective study , fine needle aspiration was done on a total of 200 female patients presenting with breast lesions.. Informed written consent from each patient was also obtained in local language. The subjects concerned included all the female patients which were referred to the Department of Pathology for FNAC of breast mass. Physical examination of breast mass by palpation was done. FNAC was done by using 22 Gauge needle attached to 20cc disposable syringe. Air-dried smears were fixed and stained with May-Grunwald Giemsa technique. One smear was fixed with 95% alcohol for Papanicolaou stain. The patients were followed up for mastectomy or biopsy. Histopathological findings were noted. The statistical analyses were done to find the ability of FNAC to detect the presence of malignancy in the breast in comparison to histopathology. For this sensitivity, specificity, positive and negative predictive value and accuracy/efficiency were calculated.

atypical, 101 (50.5%) cases were found to be benign on FNAC and in 23 cases (11.5%) the results were unsatisfactory.

Table-2 Showing comparasion of FNAC results with that of histopathological examination in 87 follow up cases.

Serial no.	Cytological diagnosis	No. of cases available on HP	Malignant on HP	Benign on HP
1	malignant	40	39	01
2	Atypical or suspicious	01	01	Nil
3	benign	43	00	43
4	unsatisfactory	03	01	02

Out of total 200 cases of breast FNAC, 87 cases had histopathology correlation. out of 87 cases 40 were diagnosed as malignant by cytology, out of which 39 were found be malignant, 1 turned to be fibroadenoma (false positive). One case diagnosed as atypical on cytology was confirmed as carcinoma on histopathology. out of 3 unsatisfactory smears in which histopathology was available one came out to be malignant (false

negative) while two turned out to be benign. 43 cases were cytologically diagnosed as benign and all proved to be benign on histopathological examination.

So out of 87 cases, 41 were detected malignant by histopathological examination while 46 came out to be benign.

Table-3 Split up of 41 histopathologically confirmed malignant cases.

Serial no.	Diagnosis on HP	No.of cases
1	IDC	37
2	IDC + ILC	02
3	ILC	01
4	MC	01
	Total	41

Out of 41 malignant cases , 37 were diagnosed as infiltrating ductal carcinoma, 1 as lobular carcinoma, another 1 as medullary carcinoma

while 2 were diagnosed as infiltrating ductal carcinoma and lobular carcinoma combined.

Table-4 Split up of 46 histopathologically confirmed benign cases.

Serial no.	Diagnosis on HP	No.of cases
1	fibroadenoma	13
2	Fibrocystic disease	17
3	Intraductal papilloma	02
4	Breast abscess	14
	total	46

Out of 46 benign cases , 13 were diagnosed as fibroadenoma, 17 as fibrocystic disease,

2asintraductal papilloma while14 were diagnosed as breast abscess.

Table- 5 Showing various values (as calculated from 87 available follow up cases)

True positive= 40, true negative= 45, false positive= 1, false negative= 1
Sensitivity = true positive/true positive + false negative x 100 = 40/40+1 x 100= 97.56%
Specificity = true negative/true negative + false positive x 100 = 45/45+1 x 100= 97.82%
Positive predictive value = true positive/true positive + false positive x 100 = 40/40+1 x 100= 97.56%
Negative predictive value= true negative/true negative + false negative x 100 = 45/45+1 x 100= 97.82%
Accuracy =true positive +true negative /total cases = 40+ 45/87 x 100 = 97.77%

Sensitivity in the present study was calculated as 97.56% and specificity 97.82% and overall accuracy found to be 97.77%. positive and

negative predictive values found out to be 97.56% and 97.83%.

Table-6 Showing age wise distribution of Benign Lesions

Serial no.	diagnosis	0 -10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs
1	FA n = 13	nil	3 23.07%	9 69.23%	1 7.69%	nil	nil	nil	nil
2	FCD n = 17	nil	2 11.76%	10 58.82%	4 23.52%	1 5.88%	nil	nil	nil
3	IDP n = 02	nil	nil	1 50.00%	1 50.00%	nil	nil	nil	nil
4	GALACTOCELE n = 0	nil	nil	nil	nil	nil	nil	nil	nil
5	BA n = 14	nil	1 7.14%	9 42.85%	2 14.28%	1 7.14%	1 7.14%	nil	nil

For benign lesions the maximum number of pateints were between 21-30 yrs of age.

Table-7 Showing age wise distribution of malignant Lesions

Serial no.	diagnosis	0 -10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs
1	IDC n = 37	nil	nil	5 13.5%	14 37.83%	13 35.15%	3 8.10%	2 5.40%1	nil
2	ILC n = 1	nil	nil	nil	1	nil	nil	nil	nil
3	MC n = 1	nil	nil	nil	1	nil	nil	nil	nil
4	ILC+IDC n = 2	nil	nil	1	1	nil	nil	nil	nil
	TOTAL	0 0%	0 0%	6 14.65%	17 41.46%	13 31.70%	3 7.3%	2 4.8%	0 0%

For malignant lesions the maximum number of pateints were between 31-40 yrs of age followed by 41-50 yrs of age.

Table- 8 Statistical analyses of FNAC as a diagnostic test

study	Sensitivity %	Specificity %	Positive predictive value%	Negative predictive value %
Present study	97.56	97.82	97.56	97.82
Choi et al ⁽¹²⁾	77.70	99.20	98.40	88.0
Park and Ham ⁽¹³⁾	76.90	91.60	-	-
Mohammed et l ⁽¹⁴⁾	90.62	100	100	95.08
Kim et al ⁽¹⁵⁾	94.59	87.91	79.54	97.03

Size and site of the breast lumps in our study shows that for benign lesions all cases were 2cm to 4cm size. For malignant lesions ,size varied from 2.5cm to 10cm. In malignant group the maximum involvement was that of upper outer quadrant accounting to 21/41 (51.21%) cases followed by central area which was involved in 8/41(19.5%)cases followed by 4 cases(9.75%) in inner upper, inner lower and outer lower quadrant. Like malignant group fibroadenoma had a high occurrence rate in upper outer quadrant 6/13 (46.15%) followed by upper inner and lower outer quadrant.

Discussion

In this study for fibroadenoma the age ranged between 17 to 35 yrs. The maximum cases were between 21-30 years (9/13 i.e. 69.23%) followed by age group 11-20 years(3/13 i.e. 23.07%). According to Robbins et al age group for fibroadenoma is any time in fertile age group though the commoner age is less than 30 years.⁽³⁾Eisenberg et al in their 10 year study of 1900 cases dubbed the average age for all benign lesions of the breast as 55 years (range 12-84 years)⁽⁴⁾. So the results of our study are comparable with Robbins et al but not with Eisenberg et al.

In the present study, fibrocystic disease (36.95%), followed by mastitis/breast abscess (30.4%) and fibroadenoma(28.2%) were the most common benign breast lesions on cytology. However in a study by Tiwari^[5] and Qasim et

al.,^[6]fibroadenoma (56.25% and 82.14%) followed by mastitis/breast abscess (20.31% and 10.71%) and fibrocystic disease (7.81% and 3.57%) were the most common breast lesion.

In the present study for malignant lesions the maximum number of patients were between 31-40 yrs of age followed by 41-50 yrs of age. Similar findings have been reported by MacIntosh et al.⁽⁷⁾ and Rocha et al.,⁽⁸⁾ who reported maximum number of suspicious cases in the age groups 33-75 years and 31-75 years, respectively. Malignant lesions were common in the age groups 31-70 years in the present study, 63-79 years in the study by MacIntosh et al.⁽⁷⁾ and 41-75 years in the study by Rocha et al.⁽⁸⁾

In this study , 68/200 malignant lesions detected , while in study by Domínguez et al.,⁽⁹⁾ 147 cases were seen. Out of 41 histologically confirmed malignant cases , 31 were diagnosed as infiltrating ductal carcinoma(IDC), 1 as lobular carcinoma, another 1 as medullary carcinoma while 2 were diagnosed as infiltrating ductal carcinoma and lobular carcinoma combined . IDC was most common in the present study with 37/41 (90.24%) cases in present study and 141 (95.91%) in study by Domínguez et al. In the study by Domínguez et al.,⁽⁹⁾mucinous carcinoma was seen in 1 (0.68%) case. Lobular carcinoma was seen in only 1 (1.53%) case in this study, while it was second common tumor in a study by Domíngue et al with 4 (2.72%) cases.⁽⁹⁾

As overall pattern of type of malignancy with IDC accounting for >85% cases in both studies, generally there is a tendency not to sub classify malignant tumors on FNAC. Zuk et al in 1989⁽¹⁰⁾ classified all aspirates into the following groups: Inadequate: Either extremely hypocellular with regard to epithelial cells or blood stained to an extent that all other elements are obscured. Benign: Characterized by sheets of regular ductal cells with nuclear features of benign cells, often admixed with a large number of “stripped” nuclei. Suspicious: Hyper cellular specimen, which had an admixture of regular cells and others with abnormal nuclear and cytoplasm features falling short of a firm diagnosis of malignancy. Malignant: Hyper cellular specimen comprising cells with unequivocal cytological features of malignancy. In 2000, Tabbara et al.⁽¹¹⁾ recommended in the national comfort institute conference the use of a standardized approach for the reporting of breast FNAs. The classification system proposed at the conference places breast FNAs into one of five categories.

Benign

Atypical/indeterminate

Suspicious/probably malignant

Malignant

Unsatisfactory.

In the present study, sensitivity was more than the study by Choi et al,⁽¹²⁾ and Park and Ham⁽¹³⁾, Mohammed et al.⁽¹⁴⁾ and Kim et al.⁽¹⁵⁾ In the present study, specificity was more than the study by Park and Ham⁽¹³⁾ and Kim et al⁽¹⁵⁾ but less than study by Mohammed et al.⁽¹⁴⁾ and Choi et al.⁽¹²⁾ In the present study, positive predictive value was more than the study by Kim et al[16] but less than study by Choi et al⁽¹²⁾ and Mohammed et al.⁽¹⁴⁾ In the present study, negative predictive value was more than the study by Choi et al,⁽¹²⁾ Mohammed et al,⁽¹⁴⁾ and Kim et al.⁽¹⁵⁾ [Table 8]. Hence in general , all have good sensitivity, specificity, positive and negative predictive value.

Sreedevi CH et al⁽¹⁶⁾ in their study has shown that over all FNAC is 98% accurate for diagnosing breast lesions and 85.7% accurate for malignant tumour diagnosis. In our study overall accuracy was found to be 97.77%.

Veena Kumari et al ⁽¹⁷⁾ reported that the diagnosis of malignancy was given in 26 cases in FNAC. They are correlated with histopathology and confirmed. They are equally common in right and left breasts but more common in upper quadrants .In our study maximum involvement was that of upper outer quadrant accounting to 21/41 (51.21%) cases followed by central area.

Conclusion

Fine-needle aspiration cytology is a rapid and effective method for the primary categorization of palpable breast lumps into benign, malignant, atypical, suspicious, and unsatisfactory categories. Benign breast lesions are common than malignant lesions, fibroadenoma and fibrocystic disease are more common in benign disease, whereas IDC accounts for the highest number of malignant lesions. Histological correlation indicated FNAC to be a good diagnostic tool.

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