



DIAGNOSTIC ACCURACY OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) IN BREAST LESIONS

Pathology

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ABSTRACT

Introduction : Fine needle aspiration cytology (FNAC) has revolutionized the approach to diagnosis and management of breast and various other lesions. Its accuracy in many situations avoids any unnecessary surgical procedures.

Aim & objective : The aim of this study was to analyze and correlate the diagnosis of breast lesions on cytology with histopathology finding and to determine the sensitivity, specificity and accuracy of FNAC in the diagnosis of breast lesions.

Material and Method : The Present study consist of total 200 breast aspirates from may 2019 to November 2019 in pathology department of tertiary care teaching hospital, Ahmedabad. Histo-cytological correlations were obtained in 80 cases.

Results : Out of the 200 cases, 11 % were inflammatory, 65 % were benign, 22 % were malignant and 2 % were suspicious for malignancy. The most common benign lesion was fibroadenoma of breast while the most common malignant lesion was ductal carcinoma. The present study shows sensitivity 94.7%, specificity 100%, Positive predictive value 100 %, negative predictive value 95.4% and efficiency 97.5%.

Conclusion: FNAC of breast lesions serves as rapid, economical and reliable tool for diagnosis of palpable breast lesions and cytopathological examination of these lesions before operation or treatment serves as an important modality. So, it is an important diagnostic adjunct to the management of palpable breast lump.

KEYWORDS

Fine needle aspiration cytology, Fibroadenoma, Ductal carcinoma

INTRODUCTION

FNAC is one of the most popular technique utilized for the diagnosis of palpable masses anywhere in the body, it is sensitive, specific, expedient, economical, safe and less time consuming without much discomfort to the patients. In case of breast masses, FNAC is commonly used as a part of the diagnostic triad in addition to the clinical examination and mammography.¹ FNAC procedure was first introduced by Martin and Ellis for the palpable breast masses in 1930 and since then it has been established as one of the important tool in the evaluation of breast lesions.¹ Many countries have breast cancer screening programs aimed at detecting early disease in asymptomatic patients. The diagnostic process involves the "Triple test" consisting of clinical examination, mammography and FNAC.² The main aim of FNAC is to differentiate the benign lesions from the malignant ones, which requires more radical therapy.³ Nowadays, patients suffering from breast cancer have been increasing. This study was intended to look at the age wise distribution of various breast lesions using FNAC and to assess the diagnostic accuracy.

AIMS AND OBJECTIVES

The present study was undertaken with the aim to analyze breast lesions to determine its age wise distribution, to study morphological findings, to correlate cytology with histopathological findings, and to determine the diagnostic accuracy of FNAC.

MATERIAL AND METHOD

This was a prospective study which includes 200 cases of palpable breast masses. This study was done between May 2019 to November 2019 in Pathology department of tertiary care teaching hospital, Ahmedabad.

After explaining the patients about the procedure, detailed clinical, past and family history was taken. Thorough local examination of both breast and axilla was carried out in presence of a female attendant. The major chief complain with which patients presented during the present study was lump and/or pain in the breast, and/or nipple discharge.

FNAC procedure was done with 22-23 gauge needle. The aspiration and non-aspiration technique with minimum 3-4 passes used to minimize haemorrhage. The sample were placed on a glass slide and smears were made by inverting second glass slide over the drop and as it spreads, pulling the slides apart horizontally or vertically. Smears

were either immediately fixed with ethyl alcohol or kept air dried. The fixed smears were subjected to H & E and PAP stain while, the air dried smears were subjected to giemsa stain, followed by microscopic examination. Histo-cytological correlations were obtained 80 cases. In that case through gross examination was carried out, sections were processed by routine tissue processing, H & E stain was applied on cut sections. Histopathological diagnosis was recorded.

RESULTS

The present study included 200 breast masses, which were diagnosed on cytology during the month of May 2019 to November 2019.

The age of the patients in the present study varied from 15 to 80 years (Table 3). Out of 200 cases, Female and Male patients were 195 and 5 respectively, with male to female ratio is 39:1.

Benign breast lesions were the most common in young females, and the malignant lesions were common in fourth and fifth decades of the life.

The Distribution of lesion was seen to be more in the right (109) compared to left breast (85) and bilateral (6). The upper outer quadrant of breast was the most common quadrant to be involved by the lump followed by upper inner quadrant and lower outer quadrant. The most common benign lesion is fibroadenoma (55%) while most common malignant lesion is IDC (21%).

Table 1: Distribution Of Breast Lesions

Category	Cytological diagnosis	No. of cases	Percentage %
Inflammatory lesions (22 cases-11%)	Acute mastitis	20	10
	Tuberculous mastitis	00	00
	Granulomatous mastitis	01	0.5
	Fat necrosis	01	0.5
Benign breast lesion (130 cases-65%)	Fibroadenoma	110	55
	Fibrocystic disease	09	4.5
	Galactocele	02	1
	Lactational change	01	0.5
	Gynecomastia	08	4.0

Malignant Breast lesion (44 cases-22%)	Ductal carcinoma	42	21.0
	Lobular carcinoma	01	0.5
	Malignant Phyllodes Tumor	01	0.5
Suspicious of malignancy (4 cases-2%)	Atypical cells suspicious of malignancy	04	2
Total		200	100

Table 2: Histopathological correlation of breast lesions

		Histopathology		Total
		Benign	Malignant	
FNAC	Benign	42	2	44
	Malignant	00	36	36
Total	42	38	80	

FNAC finding of 80 cases were correlated with histopathological findings taking histopathological diagnosis as the "gold standard". Out of 80 cases all 36 malignant lesions were confirmed histopathologically. Out of 44 benign cases, 42 were confirmed but 2 cases turned to be malignant on histopathological examination. A case of fibroadenoma was found to be IDC on histopathological examination, and a case of benign cystic lesion was diagnosed as a malignant phyllodes tumor on histopathological examination.

The statistical analysis showed high sensitivity (94.7%) and specificity (100%) of FNAC in breast lesions, with positive Predictive Value (100%) and Negative Predictive value (95.4%). The diagnostic accuracy was found to be 97.5%.

DISCUSSION

Breast cancer is one of the common clinical problem in developed as well as developing countries. FNAC of breast lumps is an accepted and established method for determining the benign or malignant natures of various breast lumps with a high degree of accuracy^{6,7}

Table 3: Comparison of Age wise incidence of breast lesions.

Age group	S. Shrikanth et al ⁸			Present study			
	Benign	Malignant	Total	Benign	Malignant	Suspicious	Total
10-19	22	1	23	25	-	2	27
20-29	36	0	36	65	-	1	66
30-39	17	4	21	40	7	0	47
40-49	8	3	11	16	24	1	41
50-59	2	5	7	4	10	0	14
60-69	0	1	1	2	2	0	4
70-79	1	0	1	0	1	0	1
Total	86	14	100	152	44	4	200

Table 4: Comparison of FNAC diagnosis with other studies

Author	Benign	Malignant	Suspicious for malignancy	Inflammatory	Total
Kuldeep Singh ⁹ (2001)	83.33%	14.58%	2.08%	0	240
Bukhari et al ¹⁰ (2010)	63.76%	28.23%	7.52%	0.47%	425
Tohuidin ¹¹ (2011)	82.25%	13.74%	3.24%	0.76%	524
Present study	65%	22%	2%	11%	200

In the present study the number of benign lesion are less and malignant lesions are more compare to Tohuidin and Kuldeep singh. This may be due to our tertiary care hospital.

During the present study, out of 44 cytologically diagnosed benign cases, 42 cases were confirmed histopathologically. However, a case of benign cystic lesion by FNAC was later on diagnosed as a malignant phyllodes tumor by histopathological examination. This suggests that if the cyst fluid comes; repeat aspiration should be done from solid area after evacuation of cyst or image guided FNAC should be performed to locate solid area. Another case of fibroadenoma was turned out malignant and diagnosed as IDC on histopathological examination. The possible reasons could be early presentation with small sized tumor, inadequate sampling and hypocellularity during aspirations, problems with interpretation considering age factor, cellularity, and other histological subtypes such as scirrhous tumors. It is always necessary to correlate the FNAC finding with clinical diagnosis and mammography findings.

Table 5: Comparison of accuracy of FNAC with other studies

Author	Feichter et al (1997) ¹²	O'Neil (697) 1997 ¹³	Ariga (1,158) 2002 ¹⁴	Bukhari et al(2011) ¹⁰	Present study
Sensitivity	86%	97%	98%	98%	94.7%
Specificity	99.3%	78%	97%	100%	100%
Positive predictive value	99.3%	92%	99%	97%	100%
Negative predictive value	95%	92%	97%	98%	95.4%
Efficacy	93%	92%	97%	98%	97.5%

The high specificity and positive predictive value results allow for the early diagnosis, treatment and management of breast cancer. The sensitivity and specificity of the results have made management of breast lumps easier for surgeon and more beneficial to the patients. From the literature, the sensitivity ranges from 80% to 90% and the specificity may be up to 100%.^{15,16,17,18}

CONCLUSION

FNAC is an diagnostic adjunct in the management of patient with breast lump as it is a reliable, safe and accurate diagnostic method as well as office procedure and do not require anaesthesia. Recently popularity of FNAC has grown many folds and become a most valuable tool in the diagnosis of palpable breast masses it is sensitive, specific, expedient, economical and safe. So, commonly used as a part of diagnostic triad in case of palpable breast lump, along with clinical examination and mammography. Adhering to the principle of Triple test, acquisition of technical, observational and interpretative skills will enhance the diagnostic accuracy.

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