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Role of Fine Needle Aspiration Cytology in Breast Lesions in Correlation with Histopathology – A 4 Years Study

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ABSTRACT

Background: Breast lesions are most common among women, where majority of the breast lesions are benign. Even though most of the breast lesions are benign; malignant lesions are most concern, as because they are commonest malignant lesions especially among western population. Fine Needle Aspiration Cytology (FNAC) has proved to be a safe cost effective, good screening and quick procedure for early diagnosis of palpable breast lesions. Aim: The aim of this present study is to diagnosis different categories of various breast lesions and correlation of FNAC and Histopathological diagnosis. **Methods:** This study was done on 224 breast lesions with palpable breast swellings referred to Department of Pathology, Government Medical College, Kadapa, Andhra Pradesh over a period of 4 years from January 2015 to December 2018. Lesions were categorised as per cytomorphological features obtained on FNAC. Histopathological correlation was assessed in all breast lesions, inclusive of all malignant cases. **Results:** Out of 224 breast lesions, 178 (79.46%) cases were categorized as Benign and 39 (17.4%) cases as malignant, 7 cases (3.12%) are inflammatory. Most common benign lesions are fibroadenoma i.e., 54%. Most common malignant lesions are Infiltrating duct cell carcinoma, it was 16.96%. Uncommon malignant lesion is medullary carcinoma, it was 0.44%. Out of 224 palpable breast lesions, 203 (90.63%) diagnosed by histopathology were consistent with FNAC. **Conclusion:** FNAC is safe, cost effective, good screening, quick outpatient procedure with high sensitivity & sensitivity and histopathology is a confirmatory diagnosis and especially it can help to confirm suspicious malignant cases.

Keywords: Breast lesions, FNAC, Histopathology.

INTRODUCTION

Fine Needle Aspiration Cytology (FNAC) is the first choice in investigation of palpable breast lesions in both screening and symptomatic populations. It is also well accepted diagnostic tool for management of breast lesions with high accuracy.[1] FNAC has high sensitivity and high specificity for most of the malignant and benign lesions. FNAC in most cases definitive treatment can often be based on cytological diagnosis without the need for histopathological examination unless there is suspicion of malignancy.

Breast lesions are most common among women, where majority of the breast lesions are benign. Even though most of the breast lesions are benign; malignant lesions are most concern, as because they are commonest malignant lesions especially among western population.[2] Benign breast diseases constitute a heterogeneous group of lesions including developmental abnormalities, inflammatory lesions, epithelial and stromal proliferations, and neoplasms.

In this generation surgery or open biopsies are not playing vital role as a diagnostic tools, due to availability of various methods of screening and diagnostic modalities including Fine needle aspiration cytology, biopsy, Mammography, Ultrasound, MRI imaging, Gene studies.

Most of the countries are following triple approach by clinical, radiological and pathological for diagnosis of breast lesions, however, some variation is expected on proceeding to diagnose breast lesions.[3] Proper implementation of diagnostic techniques by physician, oncologist, radiologist and pathologist and also assessment of patient's risk of developing cancer, can help to achieve early and accurate diagnosis of breast lesion.

The aim of this present study is to diagnosis of different categories of various breast lesions and to confirm pre operative suspected malignant cases.

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MATERIALS AND METHODS

The present 4 years study from 2015 to 2018 was done on breast lesions by Fine Needle Aspiration Cytology (FNAC) in correlation with Histopathology of Government Medical College,

Kadapa, Andhra Pradesh. Patients with breast lesions were referred from Government General Hospital, Kadapa, Andhra Pradesh. Informed consent was taken from all the patients.

Aspiration was done for all the cases using 23 Gauze needle and 10 ml disposable syringe with a detachable syringe holder. These FNAC aspirations were smeared on each microscopic glass slide as 3 smears for each patient, one for Papanicolaou (Pap) stain, second smear for Haematoxylin and eosin stain and another for any further special stains like modified Giemsa stain.

Before FNAC, patient findings such as age, sex, occupation, education, address, family history and relevant examination findings were noted. FNAC findings and also findings of Biopsies of breast lesions were entered in spread excel sheet. Data was analysed by statistical figures numbers, percentages.

RESULTS

In the present study, out of total 224 breast lesions, benign cases are 178 (79.4%), malignant cases are 39 (17.4%) and inflammatory cases are 7 (3.12%). Among benign lesions, fibroadenoma was commonest i.e., 120 (54%) patients. Among malignant lesion infiltrating duct cell carcinoma (16.96%) is commonest and medullary carcinoma 0.44% is rarest. Among 7 (3.1%) inflammatory lesions 3 (42.8%) cases are tuberculous mastitis and 4 (57.1%) cases are pyogenic breast abscess. AFB stain was done on tuberculous mastitis lesions. Out of 224 breast cases which were done by FNAC, 159 (70.9%) cases were correlated (Table 1). Most of the breast lesions were present in Right breast upper outer quadrant.

Table 1: Prevalence of various types of breast lesions

S. No.	Cytological diagnosis	Type of lesions	Number of cases	Percentage
1	Benign	Fibroadenoma	120	53.5%
2		Gynecomastia	28	12.5%
3		Galactocele	2	0.8%
4		Fibrocystic disease with secondary apocrine change	2	0.8%
5		Fibroadenosis	1	0.44%
6		Phylloides	8	3.5%
7		Benign ductal hyperplasia	3	1.3%
8		Atypical Ductal hyperplasia	2	0.8%
9		Fibrocystic disease	12	5.3%
10	Malignant	Ductal cell carcinoma	38	16.9%
11		Medullary carcinoma	1	0.44%
12	Inflammatory	Pyogenic Breast abscess	4	1.7%
13		Tuberculous Mastitis	3	1.3%

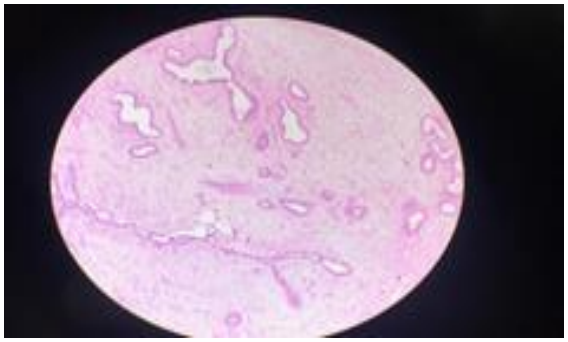

Figure 1: Fibroadenoma 10x

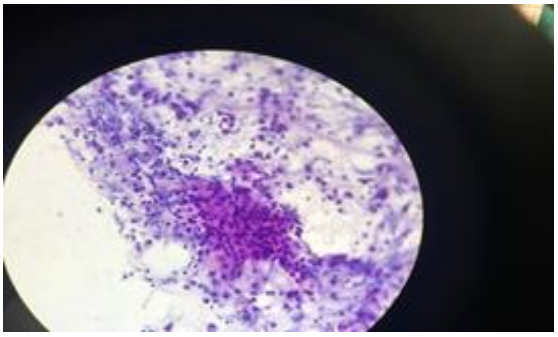

Figure 3: Fibrocystic diseases 10x

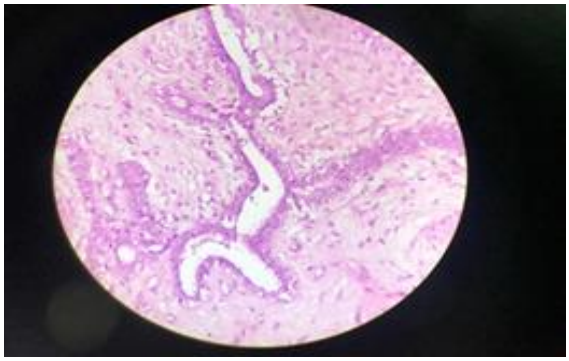

Figure 2: Fibroadenoma 40x

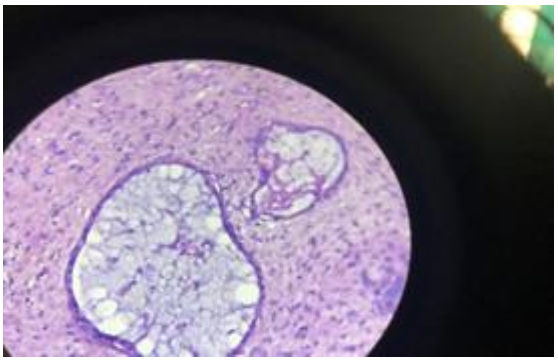

Figure 4: Fibrocystic diseases 40x

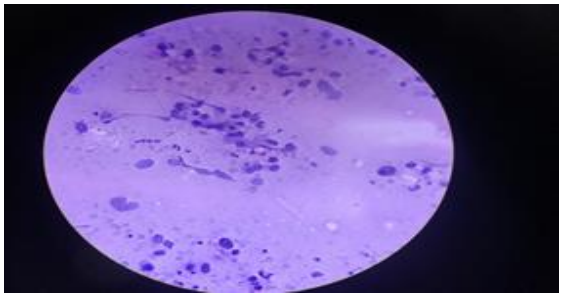

Figure 5: IDCC FNAC 40x

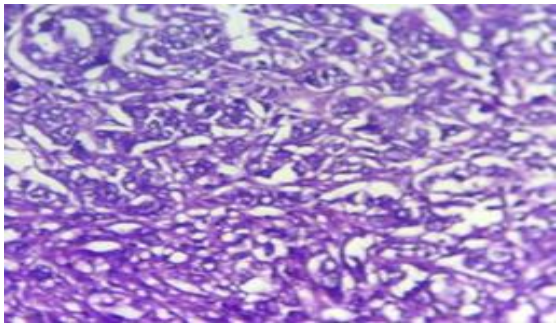

Figure 6: IDCC HPE 40x

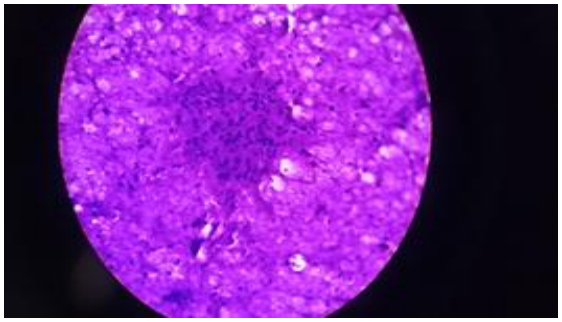

Figure 7: TB Mastitis 40x

Out of 224 breast lesions 121 (54%) were located in right breast, 98 (43.7%) were located in left breast and remaining 5 (2.2%) were observed bilaterally [Chart 1].

59.8% of breast lesions were observed in upper outer quadrants, predominant location. 28.5% were located in upper inner, 8.03% were located in lower outer, 1.78% were noticed in lower inner and subareolar location and all quadrants were involved in 0.89% and 0.89% respectively.

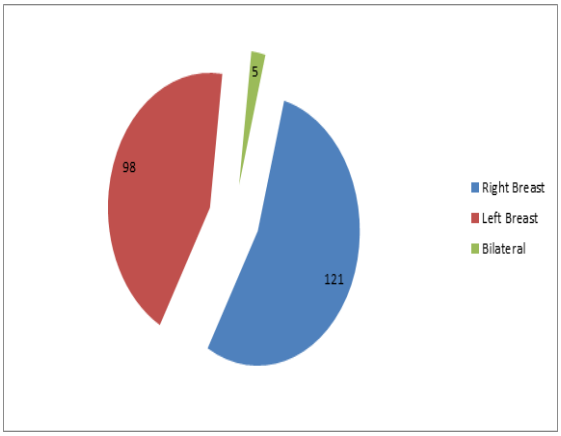

Chart 1 Anatomical distribution of Breast lesions

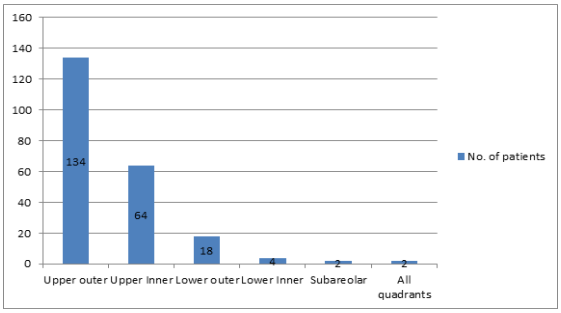

Chart 2: Quadrant distribution of breast lesions

Female predominance noted in breast lesions i.e., 196 (87.5%) patients out of 224 and remaining 28 (12.5%) patients were male. Among 196 females presented with breast lesions, 150 (76.5%) had gynecomastia and benign, 39 (19.8%) had malignant and remaining 7 (3.5%) patients were under inflammatory. All the male patients presented with Gynaecomastia and benign lesions.

Majority of the patients were in the age group of 21-30 years (48.2%), followed by 31-40 years (24.1%), 41-50 years (16.07%), 10-20 years (6.2%), 51-60 years (4.9%) and 61-70 years (0.44%). All 7 Inflammatory lesions were noted in 21-40 years. Majority of the benign lesions were observed in 21-30 years i.e., 46.4% followed by 31-40 years, it was 18.7%. Majority of the malignant lesions were observed in 41-50 years i.e., 10.2% followed by 31-40 years (4.01%) and 51-60 years (3.1%).

Table 2: Sex wise distribution of breast lesions

Sex	Gynecomastia + Benign	Malignant	Inflammatory	Total
Female	150	39	7	196
Male	28	-	-	28

Table 3: Age wise distribution of breast lesions

Age in years	Inflammatory	Percentage (%)	Benign	Percentage (%)	Malignant	Percentage (%)	Total	Percentage
10-20	0	0	14	6.2	0	0	14	6.2
21-30	4	1.7	104	46.4	0	0	108	48.2
31-40	3	1.3	42	18.7	9	4.01	54	24.1
41-50	0	0	13	5.8	23	10.2	36	16.07
51-60	0	0	4	1.7	7	3.1	11	4.9
61-70	0	0	1	0.44	0	0	1	0.44
	7	3.1	178	79.4	39	17.4	224	100

Table 4: Correlation of Cytological and Histopathological diagnosis of breast lesions

Cytological Diagnosis	No. of cases	Histopathological diagnosis				Total	Percentage
		Consistent	%	Inconsistent	%		
Benign	178	162	91.01	16	8.91	178	100%
Malignant	34	30	88.23	4	11.76	34	100%
Suspicious of Malignancy	5	4	80	1	20	5	100%
Inflammatory	7	7	100	0	0	7	100%
Total	224	203	90.63	21	9.37	224	100%

Out of 224 palpable breast lesions, 203 (90.63%) diagnosed by histopathology were consistent with FNAC and correlated with final diagnosis and remaining 21 were inconsistent with histopathological diagnosis. Predominantly malignant lesions are inconsistent; 11.76% of malignant lesions, 8.91% of benign lesions, 20% of suspicious of malignancy lesions are inconsistent.

DISCUSSION

FNAC is a minimal invasiveness, minimal discomfort, cost effectiveness screening and diagnostic tool. It helps to diagnose the lesions pre operatively and also helps in taking appropriate decision in management of patient with breast lesion.

Prevention and management of breast lesions can be done by early screening and diagnosis. In our study, commonest age group was 21-30 years, which was comparable to studies done by Farkhanda et al,[4] Chandan wale et al,[5] and Rajat gupta et al.[6] However Haque et al,[7] reported the commonest age group was 31-40 years.

The present study showed right breast upper outer quadrant were most commonly involved, which was comparable to Chandan wale et al,[5] Rajat Gupta et al,[6] reported left breast upper outer quadrant involvement. Out of 224 cases in our study 178 cases [79.46%] were benign, 39 [17%] were malignant, which are comparable to Rajat Gupta et al.[6] Most of the malignant lesions in our study occurred within age 41-50 years, which were comparable to studies done by Singh K et al,[8] Khan A et al.[9]

Fibroadenoma was commonest benign breast lesions, infiltrating duct cell carcinoma is most common among malignant lesions which were correlated with various studies] and Rajat Gupta et al.[6,10,11]

Out of 120 cases, 65 cases were benign, 32 malignant, 2 suspicious and 16 were inflammatory breast and 4 were unsatisfactory lesions. Cytological and histopathological correlation found in 114 cases (95.83%) out of 120 cases. Fibroadenoma is the most common benign breast lesion noted in 21-30 years age group, while ductal carcinoma was commonest malignant lesion noted in 41-50 years of age group. The sensitivity and specificity of FNAC were 97.05% and 98.78%.[12]

Tumours on right breast is higher in percentage (54%) and 66% of tumors are less than 6 cm in size. Two cases, which found to be malignant with FNAC have become benign in biopsy test.[13]

Out of total 343 cases of breast FNAC, 73 cases had 73 cases had histopathology correlation. Age group of the patient ranged from 17 to 84 years. Breast lumps were most commonly seen in age group 21 to 30 years which comprises of benign lesions. Maximum number of malignancy (26%) was seen in age group 41 to 50 years. Out of 73 cases, malignancy was seen in 15 cases (20.5%). The most common carcinoma was Invasive Ductal Carcinoma (IDC) with 46.7% 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 93.3% and 100% respectively.[14]

Among 222 patients, 217 were females and 5 were males. Benign breast lesions were found in 144 cases (64.87%); among which fibroadenoma (30.18%) was the commonest lesion which was observed. Malignancy was observed in 69 cases (31.08%); among them, ductal carcinoma was the predominant lesion (29.28%) which was seen. Histopathological confirmations were obtained in 90 cases out of 91 cases in which histo-cytopathological corrections were possible. All 45 malignant aspirates were confirmed by histopathology. Benign reports were confirmed in 45 out of 46 cases by doing histological examinations; except one case which was diagnosed as malignant by studying its histopathology. Sensitivity and specificity of FNAC in breast lesions were reported to be 97.82% and 100% respectively, with 100% positive predictive value and 97.85% negative predictive value. Diagnostic accuracy of FNAC in the present study was found to be 98.90%.[15]

CONCLUSION

FNAC is safe, cost effective, good screening, quick outpatient procedure with high sensitivity & sensitivity and histopathology is a confirmatory diagnosis and especially it can help to confirm suspicious malignant cases. Both are effective diagnostic modalities for breast lesions. As FNAC is a fast and simple procedure, helps physicians to diagnose early and to start accurate management.

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