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Research Article

FNAC AS A SCREENING TOOL IN DIAGNOSING PALPABLE BREAST LESIONS IN RURAL AREA

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ABSTRACT

Breast lesion is a very common presentation encountered in day to day practice. Open surgical biopsies are considered to be the "gold standard" for diagnosing palpable breast lumps. However, with modern clinical practice, minimally invasive breast biopsy techniques such as fine needle aspiration cytology (FNAC) and core needle biopsy have become popular diagnostic modalities with improved patient acceptance. This study was undertaken to evaluate the effectiveness of FNAC in investigating breast lumps in rural area where the need for medical attention was high. To the best of our knowledge and data, the effectiveness of FNAC in diagnosing breast lesions in our rural area was not done indicating the need for this study. All FNACs of breast lumps in the department of pathology in our institute between January 2009 and December 2010 were reviewed. Those cases which had histological diagnosis were correlated. The FNAC diagnosis was categorized into five categories. Benign lesions were more common than malignant. Fibroadenoma was the most common lesion and ductal carcinoma, the most common malignant lesion. The sensitivity was 88.9%, specificity 100%, the diagnostic accuracy 92.3% and accuracy of sub-typing the malignant lesions 87.5%..FNAC of breast can be carried out safely as a preoperative diagnostic method in patients. This part of the country requires more health education for patients regarding the ease, safety and accuracy of FNAC procedure which directly helps in treating the breast lumps.

Key words: Fine needle aspiration cytology, Palpable breast lesions, Rural area, Screening

INTRODUCTION:

"Breast cancers" have become one of the commonest cancers and also the leading causes of morbidity and mortality in females.[1] Breast lump is the most common presenting symptom in breast clinic. Fine Needle Aspiration Cytology (FNAC) is a popular diagnostic screening tool in evaluating breast lesions.[2] It has gained its popularity due to its fast and easy approach, being inexpensive, and can be performed with little complications.[3] The primary goal of FNAC is to separate malignant lesions that require more radical therapy from benign ones that may be conservatively managed.[4] Core Biopsy or trucut needle biopsy is not widely used because of its complications, interpretation, and time-consuming results; therefore palpable breast lesions can be accurately diagnosed by triple test only (FNAC, physical examination and Mammography).[5] Although FNAC of the breast has been shown

to be a safe and accurate technique, many surgeons question whether it is reliable enough to replace excisional biopsy.

Much statistics are available about the efficacy, sensitivity and specificity of FNACs in diagnosing breast lesions in urban areas. Our study is an attempt to know FNAC as a screening tool in diagnosing breast lesions in rural area because most cases will be lost for follow up in such areas.

MATERIAL AND METHODS:

A retrospective study of 58 patients who came to the Department of Pathology in two years for FNAC of their palpable breast masses from January 2009 to December 2010 was conducted.

The patient's consent was taken before performing the FNAC. The FNAC procedure is explained to the patients. Data of patients, clinical complaints, history of lactation and pregnancy were noted. Patients were divided into groups, and their mean age was calculated. The FNAC was done using a 23 or 22 gauge needle with 10mL disposable syringe for each prick and for each patient. No local anesthetic was used. The needle was inserted into the palpable lesions. Cellular material was aspirated into a syringe and expelled onto slides. The aspirate was put near to one end of a slide and a second slide was used to spread the aspirated material. All the smears were wet fixed in 95% methanol and stained with Papanicolaou stain. The air dried smears were stained with Hematoxylin & Eosin (H&E). The FNACs were categorized into unsatisfactory, benign, in situ lesions and malignant lesions.

Fourteen patients out of the 58 cases underwent histopathological evaluation. These specimens were fixed in 10% formalin for 24 hours and then grossed and the gross and cut section findings were noted. Adequate sampling of the specimen was done. From each block, sections were cut at 4-5 microns thickness and stained by H&E.

Criteria for Selection of Patients: Inclusion criteria employed was all patients irrespective of gender with unknown primary diagnosis of breast mass. Exclusion criteria employed was those cases with inadequate records or unavailability of the slides and blocks to confirm the diagnosis during review of this retrospective study.

Specificity, sensitivity, accuracy, and predictive values were calculated using SPSS 11 version of software.

RESULTS:

A total 58 fine-needle aspirates (FNAs) as a screening program in rural area were carried out over a period of two years in the Department of pathology. All 58 cases were female patients. The age ranged from 11years to 70years. The youngest case was an 11 year old female whose FNAC was unsatisfactory and lost to follow up while the oldest was a 70 year old patient diagnosed as having lobular carcinoma of breast. The mean age was 36.5 years. The peak age of presentation of patients with breast lesions was in the fourth decade of life. The maximum number of cases was in the age group of 31-40 years in benign breast lesions and in the age group of 41-50 years in malignant breast lesions. Right sided breast lesions were more common (25 cases) followed by left sided lesions (24 cases). Rest 9 cases presented with bilateral breast lumps. The mean size of the breast lump was 3.8 cm with a range from 1cm to 10cm. The FNACs were classified as unsatisfactory smears, benign lesions, in situ lesion and malignant lesions. The benign lesions were further sub-classified into inflammatory, non-proliferative breast disease, proliferative breast disease and miscellaneous. FNAC diagnoses of breast lumps along with age range, mean age, most common quadrant and most common side are tabulated in **table 1.**

TABLE 01: Diagnosis of breast lumps on FNAC

Lesions diagnosed on FNAC	Number of cases (Percentage)	Age range (in years)	Mean age (in years)	Most common quadrant	Most common side
I. Unsatisfactory smears	**04 (6.9%)**	**11-38**	**23**	**Upper outer**	**Right**
II. Benign lesions	**35 (60.3%)**	**15-55**	**32.7**	**Upper inner**	**Right**
Inflammatory					
Breast abscess	02 (3.4%)	28-39	33.5		Right &
Fat necrosis	01 (1.7%)	40	40	Central	left
				Central	Right
Non-proliferative breast disease					
Fibrocystic disease	06 (10.3%)	38-49	44.7		
				Upper outer	Bilateral
Proliferative breast disease					
Fibroadenoma	16 (27.6%)	15-40	24.4		
Epithelial hyperplasia	03 (5.2%)	31-55	42		Right
Papilloma	02 (3.4%)	38-40	39	Upper	Right
Adenosis	01 (1.7%)	38	38	inner	Left
				Lower outer	Bilateral
Miscellaneous					
Galactocele	03 (5.2%)	27-36	33	Central	
Nipple adenoma	01 (1.7%)	26	26	Upper outer	Left
					Right
				Central	
				Central	
III. In situ lesion					
Ductal carcinoma in situ	**01 (1.7%)**	**35**	**35**	**Upper inner**	**Right**
IV. Malignant lesions	**18 (31.1%)**	**33-70**	**47.5**	**Upper**	**Left**
Ductal carcinoma	07 (12.1%)	40-60	49.6	**outer**	Left
Apocrine carcinoma	03 (5.2%)	38-65	50.7	Upper	Right
Lobular carcinoma	02 (3.4%)	45-70	57.5	outer	Bilateral
Small cell carcinoma	02 (3.4%)	38-50	44	Upper	Left
Medullary carcinoma	01 (1.7%)	46	46	outer	Left
Colloid carcinoma	01 (1.7%)	38	38	Upper	Left
Tubular carcinoma	01 (1.7%)	37	37	outer	Right
Malignant Phyllodes tumor	01 (1.7%)	33	33	Upper inner	Right
				Central	
				Upper outer	
				Upper outer	
				Lower outer	

The most common diagnosis on FNAC was fibroadenoma (16/58 cases, 27.6%) followed by infiltrating ductal carcinoma (07/58 cases, 12.1%). Commonest among benign lesions were fibroadenoma (16/35 cases, 45.7%) followed by fibrocystic disease (06/35 cases, 17.1%). Amongst the malignant lesions, infiltrating ductal carcinoma (07/18 cases, 38.8%) was the commonest followed by apocrine carcinoma (03/18 cases, 16.6%).
Out of 58 cases, 14 cases had histopathological correlation with 8 cases of malignant lesions and 6 cases of benign lesions. **(Table 2)**

TABLE 02: Cyto-histological correlation

Lesions	**Diagnosis on FNAC**	**Number of cases**	**Diagnosis on HPE**
Unsatisfactory	Unsatisfactory	01	Fibroadenoma
Benign	Fibrocystic disease	02	Fibrocystic disease
	Fibroadenoma	02	Fibroadenoma
	Fibroadenoma	01	Fibroadenoma with atypia
Malignant	Ductal carcinoma	02	Ductal carcinoma
	Apocrine carcinoma	01	Apocrine carcinoma
	Lobular carcinoma	02	Lobular carcinoma
	Small cell carcinoma	01	Small cell carcinoma
	Medullary carcinoma	01	Medullary carcinoma
	Colloid carcinoma	01	Ductal carcinoma

The cyto-histological correlation of the breast lesions was seen only in a small number of patients in our study as most of the patients were lost to follow up. Following histopathological correlation with FNAC, we calculated the sensitivity, specificity, positive predictive values, negative predictive value, diagnostic accuracy and accuracy of sub-typing the malignant lesions. All cases of malignancies in FNAC proved to be malignant lesion on biopsy. In one of the malignant lesion, sub-typing was done in FNAC as Colloid carcinoma but it was infiltrating ductal carcinoma on histopathology. This accounted for sub-typing discordance. One case of FNAC was unsatisfactory which on lumpectomy showed fibroadenoma. A case of fibroadenoma with atypia on histopathology was diagnosed as fibroadenoma on FNAC accounting for false negative. There were no false positive cases. Therefore, in the this study, the sensitivity was 88.9%, specificity 100%, positive predictive value was 100%, , negative predictive value 80%, the diagnostic accuracy 92.3% and accuracy of sub-typing the malignant lesions 87.5%.

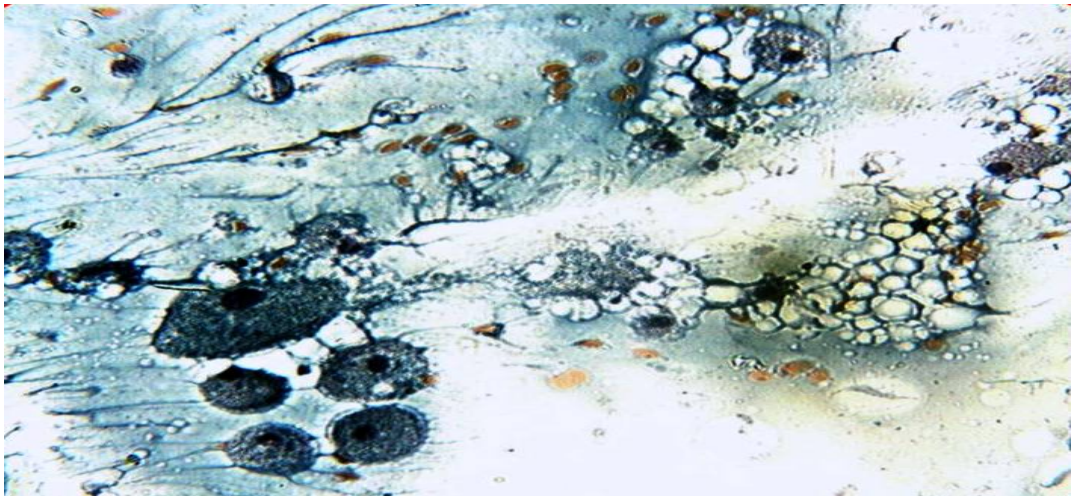

Figure 1: Galactocele: Singly scattered large foam cells with droplet filled cytoplasm in a background of lipid rich material [Pap stain; 400X magnification]

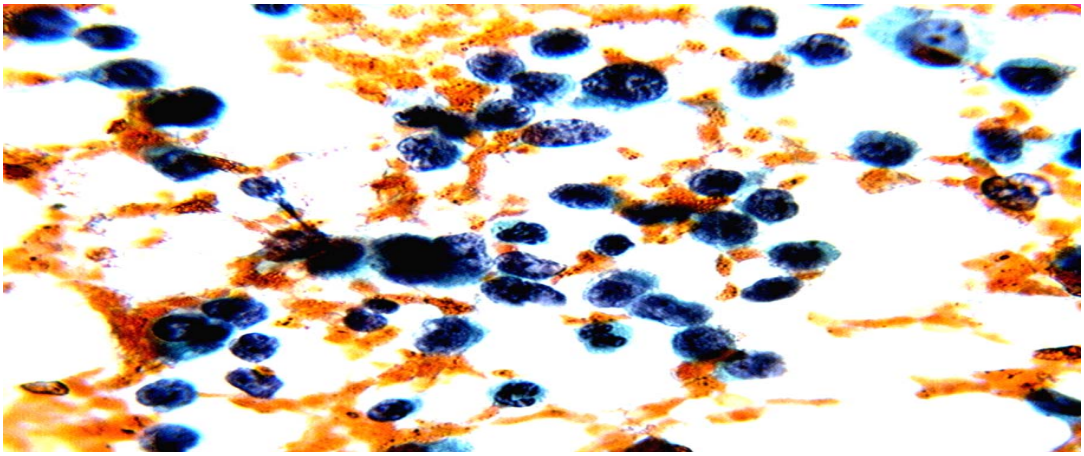

Figure 2: Small cell carcinoma

Singly scattered small tumor cells with scant cytoplasm and coarse granular nuclear chromatin [Pap stain; 400X magnification]

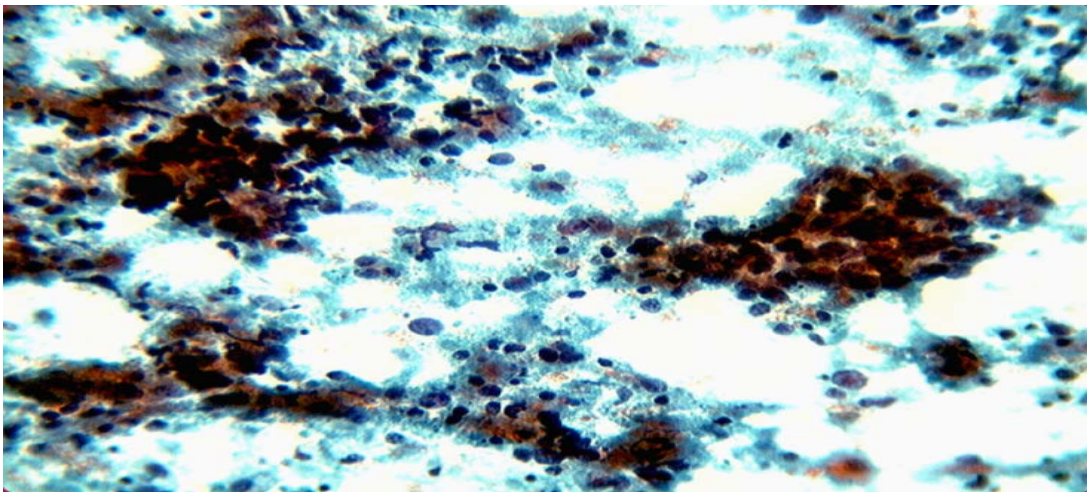

Figure 3: Medullary carcinoma

Loose clusters and singly scattered tumor cells with admixture of lymphocytes [Pap stain; 100X magnification]

DISCUSSION:

The application of FNAC for the diagnosis of palpable breast masses was first introduced by Martin and Ellis [6] in 1930, and since then, it has been established as an important tool in the evaluation of breast lesions. FNAC of breast lump is an accepted and established method to determine the nature of breast lump. [6] The most significant advantage of FNAC is the high degree of accuracy, rapid results, and a less invasive procedure than a tissue biopsy. In our study, unsatisfactory smears accounted for 6.9% of cases. The frequency of inadequate cases are variable is different studies ranging from 0 to 57.2% depending on various factors. [7] The main causes for inadequate smears may be due to either lack of technical experience in performing FNAC, preparation and fixation of smears. [7] FNAC of ill-defined masses like or lesions with hyalinization and deeply located lumps may also be contributed to the inconclusive diagnosis. [8]

In present study, benign lesions accounted for 60.3% which was comparable to study done by Rosa et al [9] who reported 60% and Feichter et al [10] reported 68.1%. Fibroadenoma is the commonest lesion in the category of benign lesions. Ferguson et al [11] and Shrestha et al [12] have also reported most common benign lesion as fibroadenoma. Many inflammatory breast lesions can present as a palpable mass. FNAC is a well-accepted diagnostic modality and procedure for the diagnosis of inflammatory swellings of breasts. In our study, inflammatory lesions accounted for 5.2% of cases. The study conducted by Shrestha et al [12] reported 9.3% cases of inflammatory lesions and Yeoh et al [13] reported 2.3%.

Singh et al [14] and Shrestha et al [12] reported that invasive ductal carcinoma is the commonest breast carcinoma and found in the age group of 41-60 years of age. The present study shows similar findings, the ductal carcinoma being the most common breast carcinoma in the age group of 41-60 year of age. We also reported cases of apocrine carcinoma, lobular carcinoma, small cell carcinoma, medullary carcinoma, tubular carcinoma and malignant phyllodes tumor. Shreshta et al [12] also reported cases of lobular carcinoma, medullary carcinoma and malignant phyllodes.

The statistics were compared with other studies in table 03.

TABLE 03: Comparison of statistical data with other studies

Studies	Total pts	Results				FN	FP	Sensitivity	Specificity	DA
		FNAC		HP						
		M/A	B	M/A	B					
Kline [15]	2151	115	774	349	1802	35	0	86	100	96
Strawbridge [16]	861	146	344	274	587	24	3	85	99	05
Abele [17]	92	27	59	32	60	1	0	97	100	99
Present	54	18	35	18	36	1	0	88.9	100	92.3

A major disadvantage of fine needle aspiration cytology is that it is not 100% accurate. False negative rates ranging from 0.7 to 22% have been reported, as well as false positive rates ranging from 0 to 4%. [15, 17, 18,19] To decrease the incidence of false negative and false positive results, the aspirate needs to be interpreted by an experienced cytopathologist. Ultrasound-guided fine needle aspirate especially where the lump is diffuse may reduce the incidence of false negatives from sampling errors. There is always the worry that an inadvertent mastectomy may be performed based on a false positive cytology, or a false negative cytology may lead to delay in the diagnosis of malignancy, but when combined with clinical examination and radiological assessment, this possibility is very small. [20]

CONCLUSION:

Breast is a part of female reproductive organ and diseases related to breast can occur in any age of a woman. Since breast is superficial in location and easily accessible, FNAC is a very safe, accurate and easily affordable preoperative screening and diagnostic procedure. This study shows the statistics of breast lumps and use of FNAC for diagnosis in our rural area. The study concluded that FNAC should be recommended for the diagnosis of suspicious breast lumps. The study also showed that health education and counseling is must in rural areas as patients in such areas are hesitant for check up and most of them will be lost to follow up by neglecting the surgery for their breast lesions.

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