

Original Article

Spectrum of Fine Needle Aspiration Cytology in palpable Breast Lumps

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Abstract

Introduction: Fine Needle Aspiration Cytology (FNAC) is a well-recognized method of investigation in breast lumps and has high sensitivity and specificity. FNAC is being performed as a pre-operative test to evaluate breast lumps and can prevent unnecessary major surgery. In this study, the spectrum and frequency of FNAC diagnoses in breast lumps and also the accuracy of the needle tip localizing the tumor during FNAC procedure were assessed.

Methods: It was a hospital based cross-sectional study conducted in the Pathology department of North Bengal Medical College. All FNAC of female breast lumps reported between January 2013 to December 2015 were included in this study. The age of the patient, size of the lump, frequency and percentage of different types of cytology diagnosis were assessed.

Results: A total of 590 FNAC cases were reported. Age ranges from 16-84 years with a mean age of 41.68 years. Among the lesions, 208 (35.25%) fibroadenoma, 123 (20.85%) fibrocystic disease, 113 (19.15%) carcinoma, 66 (11.19%) abscess, 05 (0.85%) chronic mastitis and 14(2.37%) cystic lesion were identified. Some 68.58% cases of fibroadenoma and 46.01% cases of carcinoma were in the age group 21-30 years and 41-50 years respectively. Since inadequate sample on aspiration is 2.03% in our study, the accuracy rate of needle tip in localizing the tumor in fine needle aspiration cytology is 97.97%.

Conclusion: FNAC is one of the tools for breast lump diagnosis which needs experienced hands high specificity. Fibroadenoma was the commonest lesion in this study followed by fibrocystic disease. Malignancy was detected as the third commonest lesion.

Key words: FNAC; Breast lump, Fibroadenoma

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Introduction

Palpable breast lump is a common diagnostic problem to both general practitioners and surgeons. About 10% women use to visit hospital with breast lumps as the chief complaint. 80-85% of breast lumps are benign and rests are malignant.^{1,2,3} Breast carcinoma is the leading cause of cancer incidence and death in women. It is now the most common cancer both in developed and developing countries.⁴ Early detection is the mainstay in management of breast carcinoma.

Excisional biopsy was accepted practice in the past, but presently needle biopsy makes it possible to reduce surgical excision of benign breast lesions to a minimum. The main purpose of fine needle aspiration cytology (FNAC) of breast lumps is to confirm cancer pre-operatively and to avoid major surgery in specific benign conditions.⁵ Breast carcinoma is the most common malignant neoplasm and the leading cause of death from cancer in women, with more than one million cases occurring worldwide annually.⁶ A large number of patients in Bangladesh have been suffering from breast cancer. Each year the number of patient is increasing. Because of existing social circumstances, female patients are hesitant to be examined by the clinicians for breast lump and the patients report it in advanced stage of malignancy.

FNAC could provide a diagnosis with only 10-30% of the cost of surgical biopsy. Ninety five percent accuracy in preoperative diagnosis of mammary cancer by clinico-cytological combination was reported in a study.⁷ As FNAC became more reliable in diagnosing malignancy and thereby the use of frozen section histology had been reduced by about 80 %.⁸ Now-a-days, FNAC is being performed as a pre-operative test to evaluate the breast lump. The result of FNAC in palpable breast lumps showed a very high sensitivity, specificity and accuracy. FNAC can prevent unnecessary surgery also. The present study is intended to look the frequency distribution of different lesions in FNAC of palpable breast lumps.

Materials and Methods

It is a hospital based cross-sectional study carried out from the data retrieved from the Department of Pathology of North Bengal Medical College Sirajganj, Bangladesh in a period from January 2013 to December 2015. 590 palpable breast lumps underwent fine needle aspiration cytology (FNAC) in this period. All FNAC patients were female.

Clinical Methods: FNAC were performed with 21 gz needle and 10 cc syringe. Aspiration slides were routinely stained with PAP stain. All the FNAC cases have been analyzed according to the age of the patient, size of the lump, frequency and percentage of different types of cytology diagnosis.

Results

The age distribution of the patients shown in (Table I). The age incidence was ranged from 16 to 84 years (mean age 41.68 years). The age incidence for the benign lesions ranged from 16 years to 51 years (means age 30.89 years). The incidence for the malignant lesions ranged from 25 to 84 years (mean age 47.25 years). The incidence for the inflammatory lesions ranged from 23 to 47 years (mean age 33.25 years). The

incidence for the cystic lesions ranged from 32 to 54 years (mean age 42.20 years). The most common age group for benign lesions was between 21 to 30 years and for the malignant lesion was 41 to 50 years. All the patients complained of lump in the breast. The other symptoms were pain in the lump, discharge per nipple and lump in the axilla. The duration of symptoms varied from few weeks to few year.

Table I: Distribution of all FNAC cases according to age groups (n=590)

Age in years	Inflammatory n (%)	Cystic lesion n (%)	Benign n (%)	Suspicious carcinoma n (%)	Carcinoma n (%)	Inadequate sample n (%)	Total
11-20	0 (0%)	0 (0%)	50 (8.47%)	0 (0%)	0 (0%)	0 (0%)	50 (8.47%)
21-30	32 (5.42%)	7(1.19%)	179 (30.34%)	0 (0%)	5 (0.85%)	7 (1.19%)	230 (38.98%)
31-40	37(6.27%)	4(0.68)	128(21.69%)	1 (0.17%)	16 (2.71%)	5 (0.85%)	191(32.37%)
41-50	5 (0.85%)	2(0.34%)	14 (2.37%)	1 (0.17%)	52 (8.81%)	0 (0%)	74 (12.54%)
51-60	0 (0%)	1(0.17%)	2 (0.34%)	1 (0.17%)	20 (3.39%)	0 (0%)	24 (4.07%)
61-70	0 (0%)	0 (0%)	0 (0%)	1 (0.17%)	17 (2.28%)	0 (0%)	18 (3.05%)
>71	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (0.51%)	0 (0%)	3(0.51%)
Total	74 (12.5%)	14 (2.37%)	373 (63.22%)	4 (0.68%)	113 (19.1%)	12 (2.03%)	590 (100%)

All the different FNAC diagnoses with their respective frequencies have been shown in (Table II). Majority of the cases, 373 (63.22%) were found to be benign (Figure-I) in contrast to 117 (19.83%) reported either as suspicious of carcinoma or as carcinoma (Figure-II). Among the types of the lesions, fibroadenoma showed the highest incidence 208 (35.25%) followed by fibrocystic

disease 123 (20.85%) and carcinoma 113 (19.15%) with suspicious of carcinoma in 4 cases. Inflammatory lesions were abscess 66 (11.19%), chronic mastitis 05 (0.85%), and fat necrosis 03 (0.51%). Cystic lesions were 14 cases (2.37%) and commonest was galactocele in 10 cases. Some 12 (2.03%) cases were designated as 'others' included fatty tissue, unsatisfactory smears. Among

malignant lesions 71 (60.68%) were (36.75%) presented with 2-5 cm. presented with a size less than 2 cm and 43

Table II: Frequency distribution of different categories of Lesions

Lesion category	Diagnosis	Number of FNAC cases (%)
Inflammatory n= 74	Abscess	66 (11.19%)
	Chronic mastitis	5 (0.85%)
	Fat necrosis	3 (0.51%)
Cystic lesion n= 14	Galactocele	10 (1.69%)
	Benign cystic lesion	4 (0.68%)
Benign neoplasm n= 373	Fibroadenoma	208 (35.25%)
	Fibrocystic change	123 (20.85%)
	Proliferative breast disease	42(7.12%)
Malignant neoplasm n=117	Suspicious for carcinoma	4 (0.68%)
	Carcinoma	113 (19.1%)
Other n=12	Inadequate sample	12 (2.03%)
Total		590 (100%)

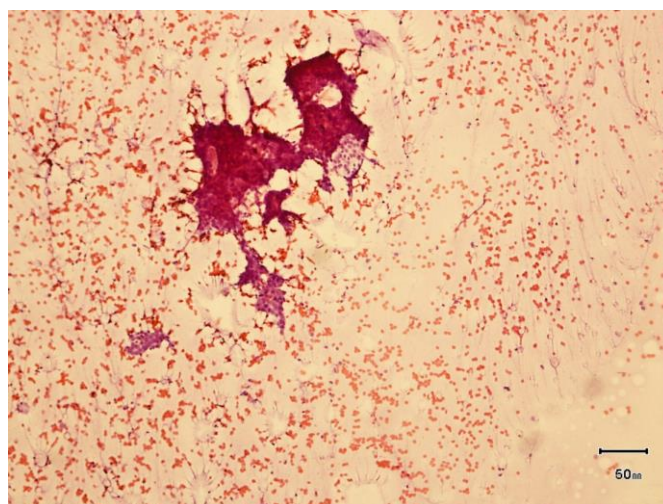


Figure I: FNAC showing clusters of benign looking ductal epithelial cells-diagnosed as “Fibroadenoma”, pap stain, 100x

In cytology, twelve cases among the 590 fine needle aspiration cytology were reported as inadequate sampling

(unsatisfactory) based on the presence of normal glandular cells. On repeat fine needle aspiration with ultrasound guidance,

all were reported as fibroadenoma. Patient underwent local excision of the tumor and histopathological confirmation later. Thus inadequate sampling rate was 2.03%.

Accuracy rate of the needle tip in localizing the tumor in fine needle aspiration cytology was 97.97%.

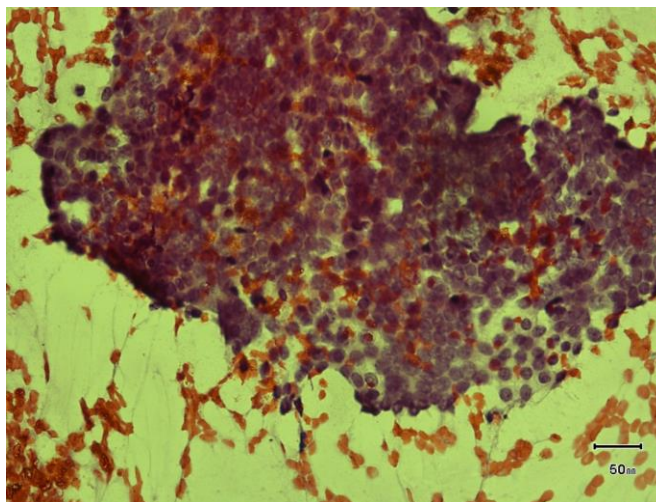


Figure II: FNAC showing clusters of malignant cells with hyperchromatic nuclei and prominent nucleoli – diagnosed as “Carcinoma”, pap stain, 400x

Discussion

Breast is an important and popular site for fine needle aspiration cytology. In 1984, Wanebo et al¹ suggested fine needle aspiration in place of open surgical biopsy for the diagnosis of breast cancer. There is an increasing tendency to confirm the diagnosis of the breast cancer at first consultation by some form of needle biopsy technique. This allows better investigation and wiser preoperative discussion than was possible when excision biopsy and frozen section confirmed the clinical diagnosis. The breast lump is usually discovered by the patient. In premenopausal women, up to 80% are benign; where as in patients over the age of 60 approximately 90% of the breast lumps are malignant. The fine needle

aspiration cytology has become the investigation of choice for the diagnosis of the breast malignancy. The typical carcinoma presents a gritty resistance to the fine needle. The aspirate is usually copious and blood stained.⁹

A total of 74 (12.54%) cases of inflammatory lesions of the breast were found in this study. This result are supported by the findings from Pakistan 15% by Bukhari et al.¹⁰ Results showed little higher from Nepal 22.6% by Kumar¹¹ and findings of Nemaqani and Yaqoob¹² showed (26.5%) from Kingdom of Saudi Arabia.

We also detected 10 (1.69%) cases of galactocele, which revealed milk during aspiration and microscopically histiocyte in the background of milk. Majority of the

cases were in the age group of 21-30 yrs which is the most active reproductive years. In this study we had 373 benign lesions (63.22%) in FNAC, fibroadenoma being the most common benign lesion that presents for needle aspiration. This has been confirmed in other series also. Fibroadenoma was found (35.25%) cause of the breast lump in this study and 68.58% were in the age group of 21-30 years. This frequency of fibroadenoma was near similar (38.3%), to the findings of Rahman et al.¹³ From Sudan among their 200 cases Ahmed et al.¹⁴ found fibroadenoma in (28%) of cases. The findings of Kumar¹¹ and Mayun et al.¹⁵ as their result were 22% and 23.7%. Besides Bukhari et al.¹⁰ showed 16% and Pradhan and Dhakal¹⁶ showed only 8% of fibroadenoma cases. The higher rate than the last studies was perhaps caused by increased awareness among young women about the breast lump in this country. Mayun et al.¹⁵ found average age of fibroadenoma was 16 years but this study found most of the cases in the age group of 21-30 years. This demands further investigation to find out whether there is any cause of this age difference in relation to inhabitation or ethnicity.

In this study, 117 (19.83%) malignant cases were detected. Previous study in Bangladesh by Rahman et al.¹⁷ showed 14.17% malignancy and Rupom et al.¹⁸ showed 13.74% of malignant cases in FNAC. Pradhan and Dhakal¹⁶ also reported 15.5% malignant cases among their 2246 cases.

Though Yip et al.¹⁹ and Bukhari and Akhter²⁰ found near results but their numbers of cases were relatively smaller, 676 and 175 respectively. Ahmed et al.¹⁴ in Sudan, Mayun et al.¹⁵ in Nigeria and Bukhari et al.¹⁰ in Pakistan reported 30.5%, 40% and 31% malignant cases. A study done by Khatun et al.²¹ showed only 14/310 (4.32%) of malignant cases. 41-50 age group showed highest number of malignant cases 52 (46.01%) and we may conclude the majority (60.17%) of the patients found in the middle age from 31-50 years. Majority of the patients (65.8%) in the age group of 31- 50 years were also observed by Sandhu et al.²² in India and Rupom et al.¹⁸ found highest requery in the 4th decade of life.

However, reports from the western world show that female breast carcinoma is predominantly seen in the fifth and sixth decades.²³⁻²⁵ Farooq and Coleman²⁶ compare age incidence between the South Asian and Non- South Asian breast carcinoma patient in England and Wales and found mean age at diagnosis of the South Asian women were 51.8 years compared with 62.8 years for non-south Asians and 16% (compared with 5%) aged under 40 years at diagnosis.

The study finding showed similarity in age of carcinoma patients with that of Sandhu et al.²² It showed that mean age of our female breast cancer patients was found to be lower compared to the western world with an average difference of one decade. Early age of menopause in Indian females in comparison to their western counterparts has

been observed in the past.²⁷ The earlier published reports also show that the risk of breast carcinoma increases with increasing age of menopause, possibly because the women are exposed to hormones for a longer duration.²⁸⁻³⁰

In another prospective study, it was concluded that fine needle aspiration cytology and core needle biopsy is complementary in the accurate diagnosis of the breast cancer.³¹ Fine needle aspiration cytology compliments clinical and radiological diagnosis; thus triple assessment has been reported to produce 99% accuracy for benign and malignant lesions. The diagnostic accuracy of clinical examination, mammography and fine needle aspiration cytology was compared with the definitive histological findings. Comparative study of all 3 diagnostic techniques in the diagnosis of breast tumor has shown that the accuracy of 99% can be achieved.³²

The accuracy of the needle tip in localizing the tumor in fine needle aspiration cytology was also studied in our series by comparing the normal glandular cell aspirate and inadequate aspirate with the tumor cell aspirate. The unsatisfactory (inadequate) sampling in which there was little or no cellular material reported, we believe, to be an error in the technique of aspiration. In our study, we had twelve aspirations which were reported as unsatisfactory, bringing the inadequate sampling rate to 2.03%. The proportion of inadequate sampling as

reported by different studies varies from 9 to 18%.³³ The accuracy rate of needle tip in localizing the tumor in fine needle aspiration cytology in present study was 97.97%. Repeat fine needle aspiration under ultrasound guidance was performed on the inadequate sampling specimen and that time it was reported as fibroadenoma. By different studies it has been also concluded that accuracy of fine needle aspiration cytology in diagnosing the breast tumors increases by performing repeat aspiration under ultrasound guidance in a lump for which previously been reported as inadequate sampling.³³

Apart from the high accuracy rate of fine needle aspiration cytology, some have raised questions about the possible dangers of cell implantation from the needle aspiration. These rare reports have largely resulted from the use of larger cutting needle (18 gauge) rather than fine needles (21 gauge). With this fine needle technique, there is essentially no danger of implantation with breast aspiration.³⁴ Franzen and Zajicek in a review of 3479 consecutive breast aspirates found no evidence of seeding along the needle tract.³⁵ This is not surprising as the needle tract is invariably removed with definitive surgery.

Conclusion

Fibroadenoma was the commonest lesion found in this study and was found mostly in the age group of 21-30 years, second commonest was fibrocystic disease.

Malignancy was detected as the third common lesion and majority was found in 41-50 years age group. Breast carcinoma patients of this region were at the lower age of one decade than that of western women. FNAC is commonly used as a part of diagnostic triad in case of breast lump, which in addition to clinical breast examination and imaging. This technique is quite attractive because of its rapidity of execution and interpretation, its low cost (compare to open biopsy of any type), and its low rate of morbidity.

Contribution of the Authors

The first author was responsible for collection of samples, interpretation of data. Others helped for computer composing and data analysis.

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