



RESEARCH ARTICLE

A CLINICOPATHOLOGIC STUDY OF VARIOUS BREAST LESIONS BY FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) IN A TERTIARY MEDICAL COLLEGE HOSPITAL OF BANGLADESH

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ARTICLE INFO

Article History:

Received 22<sup>nd</sup> May, 2018

Received in revised form

10<sup>th</sup> June, 2018

Accepted 06<sup>th</sup> July, 2018

Published online 30<sup>th</sup> August, 2018

Key Words:

Fine needle aspiration cytology (FNAC),  
Breast lump,  
Benign breast lump,  
Malignant.

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DOI: <https://doi.org/10.24941/ijcr.31590.08.2018>

ABSTRACT

The expected and significant role of cytological diagnosis is to distinguish benign from malignant processes. FNAC of the breast has two main goals. One is to confirm a radiological and clinical benign lesion and avoid unnecessary surgery and the other is to confirm a malignant diagnosis and allow definite treatment planning. In breast lesions rapid diagnosis by aspiration cytology can be particularly useful for allaying the apprehension and anxiety of the patient whose apparent solid mass may turn to be a cyst thus reducing the anguish and morbidity associated with unnecessary surgical procedures. If the lesions turn out to be malignant, the patient can be referred for immediate treatment on priority so that treatment is not unnecessarily delayed. Thus, aspiration cytology is used more and more in the diagnosis of benign and malignant lesions of the breast. It is a cost effective and safe method that can differentiate benign and malignant lesions accurately. In advanced carcinoma or unwilling patients for surgery, it can form the basis of management. The objective of this study was to analyse cases of fine needle aspiration cytology of breast lesions. This study was cross sectional study including all the patients with breast lump who attended Dhaka Community Medical college Hospital for FNAC. A total 50 cases of all ages and both sexes were included in this study. Smears made from aspirated material were collected and examined. Most of the aspirates were from females. There were more benign lesions (43 cases) as compared to malignant cases (07 cases). Fibroadenomas were the most benign lesion of breast. The age of malignant cases ranged from 21 to 60 years with a majority of cases in the age group of 41-50 years (4 cases, 57.1%). FNAC is less time consuming, safe, useful, and highly accurate technique for breast masses and can segregate benign and malignant lesions with accuracy. Triple assessment by clinical, radiological and pathological examination is a standard approach in the evaluation of breast lumps. The clinical and radiological presentations of both benign and malignant lesions can be similar- as a hypoechoic focal mass, occasionally inflammatory lesions may mimic mass like lesions or appears as non-homogenous regions on radiographs. Here, FNAC can play a major decisive diagnostic role and minimizing the requirement of biopsy.

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Citation: Kazi Farzana Khanam, Nasima Akter, Tarana Tabashum, Maruf Raza, A K M., Asma Ul Hosna, Farzana Rahman and Afroza Begum, 2018. "A clinicopathologic study of various breast lesions by Fine Needle Aspiration Cytology (FNAC) in a tertiary medical college hospital of Bangladesh", International Journal of Current Research, 10, (08), 72249-72252.

INTRODUCTION

Breast disease in women encompasses a spectrum of benign and malignant disorders. A palpable breast mass is the reason for consultation to a primary care physician in 42% of patients with breast symptoms, and accounts for more than half of breast complaints in women presenting to breast centers (Salzman et al., 2012; Bleicher, 2014). Evaluation of breast lumps involves the rational use of a detailed history, clinical breast examination, imaging modalities and tissue diagnosis.

Though the final diagnosis is made by histopathological examination of the excised tissue, routine excision of all breast lumps would not be rationale, because as much as 80% of lumps are benign (Pruthi, 2001). Thus the need is the utilisation of less invasive and cost effective methods of diagnosis without resorting to a more painful and invasive surgical biopsy. The modality should also be acceptable to the patient, accurate, easy to apply, reproducible and must not need too much preparations (Tiwari, 2007). Considering

patients' comfort, lack of requirement of anesthesia, rapid analysis and reporting, and few false positive results, fine needle aspiration cytology (FNAC) is an ideal initial diagnostic modality in breast lumps (Khemka *et al.*, 2009). It is a popular technique used in the evaluation of breast masses due to its advantages of being sensitive, specific, simple, economical, safe, quick and acceptable to the patients (Pradhan and Dhakal, 2008). Any breast lump needs a cytohistological diagnosis as even in expert hand the sensitivity of clinical diagnosis is 75% (Wilkinson, 1989). For an accurate diagnosis of the breast lump FNAC (Fine Needle Aspiration Cytology) has gained wide popularity and acceptance as a quick, simple and reliable diagnostic procedure that can be carried as outpatient service. However it has its own limitations in terms of sensitivity and specificity (Dixon and Anderson, 1984). Most countries have now adopted this triple assessment approach (clinical, radiological, and pathological) to breast diagnosis, with FNAC as the first-line pathological investigation in both screening and symptomatic populations, with the exception of cases where micro calcifications are present (Kocjan *et al.*, 2008). FNACs, especially in the hands of experienced cytopathologists, have high diagnostic accuracy, as high as 98.9% in some series (Bukhari *et al.*, 2011).

## MATERIALS AND METHODS

This hospital-based cross sectional analytical study was carried out in Department of Pathology, Dhaka Community Medical College and Hospital for a total duration of 1 year 6months from January 2017 to June 2018. Initial data was obtained by history taking and clinical examination along with radiological features. Cytology samples were obtained by FNAC performed on each patient respectively. FNAC was performed in the Pathology department by the pathologist under palpation guidance. The skin over the breast lump was cleaned with spirit cotton swab. The lesion was held with one hand and stabilised while an average 2-6 passes were made by the other hand using a 10 ml. airtight syringe with 23/25 gauge needle under constant negative pressure. Multidirectional sampling was done by moving the needle back and forth as per the recommendations of the American consensus meeting on breast needle procedures. Negative pressure was released before removal of the needle. For each smear prepared by FNAC Papanicolaou staining was done on the alcohol fixed smears. Cytology findings were grouped into 4 categories: benign, non-diagnostic, suspicious, or malignant. Of these non-diagnostic and suspicious cases were excluded from this study. Specimen adequacy was defined by the cytopathologist, based on the Bethesda conference on breast cytology guidelines (College of American Pathologists, 2014). An adequate benign specimen required at least 6 well-visualized cell groups. A hypocellular or sparsely cellular specimen was considered unsatisfactory or non-diagnostic. A specimen was considered suspicious if the cellular findings were suggestive, but not diagnostic of malignancy. A malignant diagnosis was made when sufficient well-preserved malignant cells were identified. Information regarding the treating surgeon's clinical suspicion of the palpable mass and radiological findings were obtained from the medical record.

## RESULT AND OBSERVATION

FNAC was requested for a total of 50 breast lumps during the study period. There were only one male patient of gynaecomastia and all other 49 were females. Age group of the

patients ranged from 12 to 60 years. The demographic profile is shown in (Table- 1). Of these, 43(86%) were benign and 07(14%) were malignant. (Table:1). The age of all benign cases ranged from 12 to 60 years with a majority of cases between 12 and 20 years of age (18 cases, 36%). The age of malignant cases ranged from 21 to 60 years with a majority of cases in the age group of 41-50 years (4 cases, 57.1%).

**Table 1. Distribution of age with breast lesions**

Age in years	Total number of cases and Percentage (%) (n=50)	Benign cases (%) (n=43)	Malignant cases (%) (n=07)
12-20	18 (36%)	18(41.8%)	0(0%)
21-30	15 (30%)	14(32.6%)	01(14.3%)
31-40	05 (10%)	05(11.6%)	0(0%)
41-50	08 (16%)	04(9.4%)	04(57.1%)
51 -60	04 (8%)	02(4.6%)	02(28.6%)
Total	50 (100%)	43(100%)	07 (100%)

**Table 2. Size of breast lump**

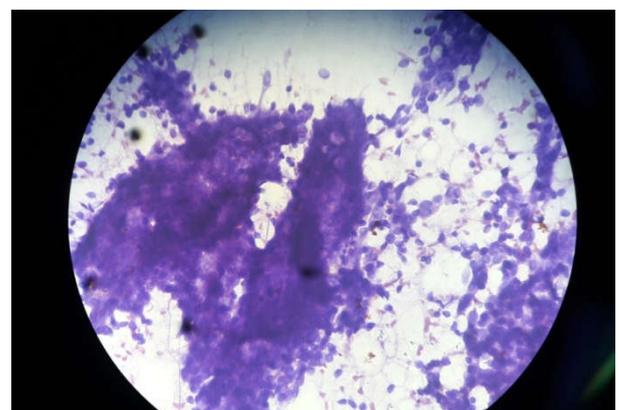
Max dimension in cm	Number of breast lump		
	Benign	Malignant	Total
≤1cm	07(100%)	00(00%)	07
1.1-≤2cm	16(94.1%)	01(5.89%)	17
2.1-≤3cm	14(73.68%)	05(26.32%)	19
3.1-≤4cm	03(75%)	01(25%)	04
≥4.1cm	03(100%)	0(00%)	03

**Table-3 Side and Location of breast lump (n=50)**

Quadrant	Number of cases (%)		
	Right	Left	Total
Upper-outer	13	11	24 (48%)
Lower-outer	02	00	02(4%)
Sub areolar	06	05	11(22%)
Upper-inner	06	04	10(20%)
Lower-inner	02	01	03(6%)
Total	29 (58%)	21 (42%)	50(100%)

**Table 4. Cytological subclassification of benign breast lump (n=43)**

Cytological diagnosis	No. of cases	Percentage (%)
Fibroadenoma	17	39.54%
Fibrocystic change/ other cystic lesion	12	27.9%
Inflammatory/mastitis/abscess	08	18.6%
Lactational change/ galactocele	04	9.3%
Gynaecomastia	01	2.33%
Benign Phyllodes	01	2.33%
Total	43	100%



**Figure 1. Showing cytology of fibroadenoma under microscope (40x objective)**

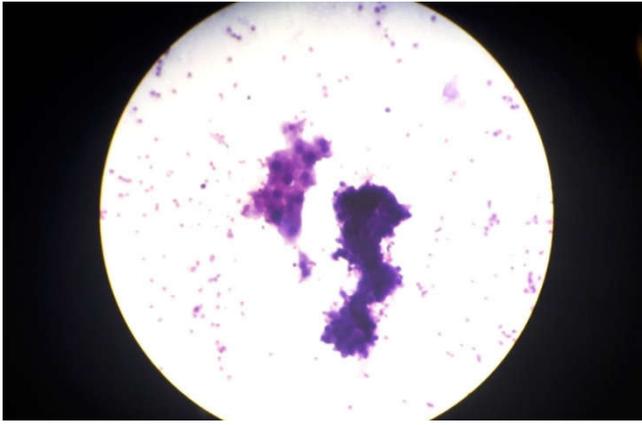


Figure 2. Showing fibrocystic change at 10x objective

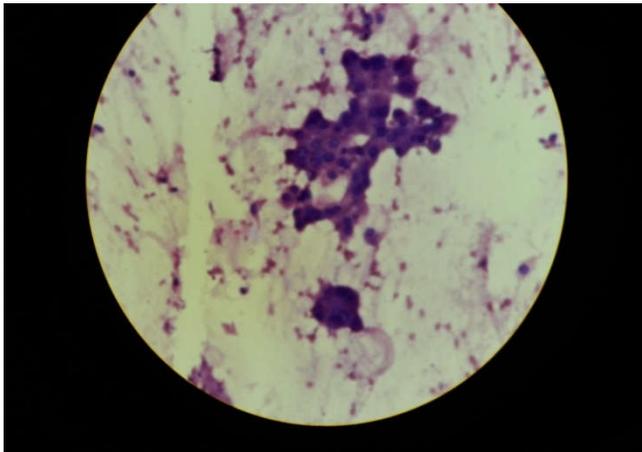


Figure 3. Showing apocrine metaplastic cells in fibrocystic change

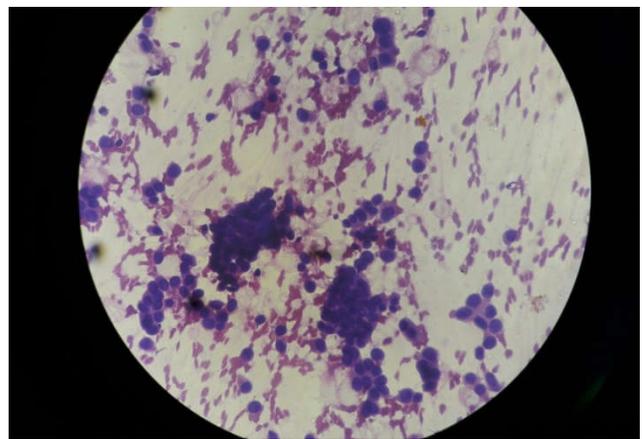


Figure 4. Showing ductal carcinoma under microscope at 40x objective

The malignant cases were mostly after the ages of 40 years. All the palpable breast lumps were in range of 1-5 cm and 19 breast lumps measured 2.1- 3 cm, of which 5 cases (26.32%) were malignant. 7 breast lump measured less than 1 cm and all were benign (Table-2). Out of 50 cases, 29 cases (58%) were in right breast, 21 cases (42%) were in left breast. Among all four quadrants, superolateral quadrant was the most common quadrant for breast lesions (24 cases, 48%) shown in Table-3. 43(86%) cases were benign with maximum number of cases of fibro adenoma (17 cases, 39.54%), followed by fibrocystic change ( 27.9%), Inflammatory/ mastitis (18%), galactocele or lactational changes (9.3%) and only one case was benign phyllodes tumor (2.33%).

## DISCUSSION

FNAC is a useful tool in the preoperative evaluation of breast lumps (Ellis *et al.*, 2001). Accurate preoperative evaluation is important as it allows for rapid referral of malignant cases for treatment and discharge of benign cases from the clinic and their return to routine follow-up (Ellis *et al.*, 2001). FNAC can also be used in following up these benign cases except when otherwise indicated. FNAC is accurate, cheap, and easy to perform and is less invasive than core needle biopsies (Garbar and Curé, 2013). In this study, 4 cases were inadequate and were excluded. So 50 cases were studied. Obviously the limitations of our study is that the sample size was small. But still we tried to observe the cases clinicopathological parameters. In this study of 50 cases, 7 cases (14%) were malignant and 43 ( 86%) cases were benign. Yeoh *et al.*,<sup>16</sup> studied 1533 breast masses on FNAC and found that 70.4% cases were benign and 4.4% cases were malignant. Similarly, Ganiat *et al.*,<sup>17</sup> studied 757 cases on FNAC and found that maximum number of cases were benign (50.2%), which was followed by malignant cases (31.4%), suspicious malignant cases (9.5%),and inflammatory cases (7.4%). The percentage of benign cases in our study was closer to that of Yeoh *et al.* 1998.

In the present study, 43 (86%) cases were benign with maximum number of cases of fibroadenoma (17/43), followed by fibrocystic change (12/43), Inflammatory/ mastitis (8/43), galactocele or lactational change (4/43), phyllodes tumor (1/43), 7(6%) cases were malignant in the present study. Aslam (2013) also documented fibroadenoma as the most common benign lesion (71.3%) in their study. Unlike our study, Jayaram *et al.*, (1996) in their study of 543 cases of FNAC found fibrocystic disease (39.8%) as the most common lesion. Pattari *et al.*, (2008) studied 71 histologically confirmed cases and documented infiltrating ductal carcinoma as the most common lesion (24/71). The patients in our study were between 16 and 66 years of age with maximum incidence in the age group of 12-20 years of 18 (36%) cases followed by 21-30 years of 15 (30%)cases. The age of all benign cases ranged from 12 to 60 years with a majority of cases between 12 and 20 years of age (18 cases, 36%). The age of malignant cases ranged from 21 to 60 years with a majority of cases in the age group of 41-50 years (4 cases, 57.1%). Hussain *et al.*, 2005 and Khemka *et al.*, 2009 studied 50 patients and they found that the maximum number of patients were in the age group of 31-40 years. Khemka *et al.*, 2009 observed that benign lesions of breast were more commonly seen in younger age groups with maximum number of patients found in the age group 30-34 years. Ganiat *et al.*, 2008 reported maximum number of patients with malignant lesions in the fourth to seventh decade of life. Among all four quadrants, superolateral quadrant was the most common quadrant for breast lesions in the present study (24 cases, 48%). Hussain *et al.*, (2005) and Khemkha *et al.*, (2009) also observed upper and outer quadrant as the commonest site. Out of 50 cases, 29 (58%) cases were in right breast, 21 (42%) cases were in left breast. Hussain *et al.*, 2005 reported left breast involvement in 27 (54%) cases and right breast involvement in 23 (46%) cases. In the present study, all the palpable breast lumps were in range of 1-5 cm and 19 breast lumps measured 2.1- 3 cm, of which 05(26.32%) cases were malignant. In lumps measuring more than 3 cm, 01(25%) cases were malignant out of 4 cases. Ballo *et al.*, 1996 studied 112 cases of the lumps with a size range of 1-12 cm and reported that 73.8% of the lumps with a

larger size (>2 cm) and 28.38% with a size <2 cm were malignant. Overall, breast lump with pain was the most common presenting complaint accounting up to 46.5%.

## Conclusion

From the above study we conclude that triple assessment by clinical, radiological and pathological examination is a standard approach in the evaluation of breast lumps. Along with clinical history and examination FNAC can help to take decision for surgery or conservative treatment. In advanced carcinoma or unwilling patients for surgery, it can form the basis of management. So FNAC should be used as a routine method for determining the nature of breast lump.

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