



## ORIGINAL ARTICLE

### Detection of Breast Lumps with Fine Needle Aspiration Cytology: Experience of 50 Cases in Bangladesh

Md. Abdul Quddus<sup>1</sup>, Nusrat Jahan<sup>2</sup>, SM Syeed-Ul-Alam<sup>3</sup>, Semonty Jahan<sup>4</sup>, Adneen Moureen<sup>5</sup>

<sup>1</sup>Professor & Head, Department of Surgery, Ad-din Barrister Rafique Ul Huq Hospital & Bashundhara Medical College, Dhaka, Bangladesh; <sup>2</sup>Residential Medical Officer, Department of Surgery, Popular Medical College Hospital, Dhaka, Bangladesh; <sup>3</sup>Assistant Professor, Department of Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh; <sup>4</sup>Public Health Researcher, BRAC James P Grant School of Public Health, Dhaka, Bangladesh; <sup>5</sup>Advisor, TB New Technologies and Diagnostics (Bangladesh), STAR Fellowship Project, Public Health Institute, United States Agency for International Development, National Tuberculosis Control Program (NTP), Directorate General of Health Services, Dhaka, Bangladesh & Former Head & Professor, Department of Microbiology, International Medical College, Gajipur, Bangladesh

#### Abstract

**Background:** Detection of breast lump is very crucial. **Objective:** This study was carried out to evaluate the effectiveness of FNAC as a diagnostic method for breast lump. **Methodology:** This cross sectional study was conducted among 50 women with breast lump at Popular Medical College Hospital, Dhaka, Dhaka Medical College Hospital and Ad-Din Barrister Rafique Ul Huq Hospital, Dhaka during the period of November 2021 to April 2022. This study was conducted using convenient type of non-probability sampling technique. Data were collected by face to face interview, clinical examination and findings of both cytological and histopathological examination. **Results:** The study revealed the most benign breast lesion (89.45%) were below the age of 40 years and most of the breast cancer (91.2%) were above the age of 40 years. The study showed that 29 cases (58.0%) were diagnosed as benign clinically but cytologically 30(60.0%) cases were benign. Clinically 14(27.0%) cases were malignant but cytologically 13(26.0%) cases malignant. Clinical diagnosis of 8(7.5%) cases were uncertain, whereas cytologically 2(4.0%) cases were suspicious of malignancy and 1(2.0%) case was atypical. The comparison study between cytological and final histopathological diagnosis showed that out of 28 benign lesions diagnosed cytologically among which only 2 cases were found malignant histologically like false negative 2 (7.20%). 13 malignant cases were diagnosed cytologically which were confirmed histologically like no false positive was found. The study found that sensitivity of FNAC 85.3% of the presence of breast cancer and specificity 100.0% for absence of breast cancer. They also showed that the negative predictive value of FNAC for benign breast lump was 93.5% and positive predictive value for malignant breast lump was 100.0% and the overall diagnostic accuracy was 95.40%. **Conclusion:** In conclusion, FNAC can be used as a diagnostic method in the management of breast lump which has reasonable sensitivity and specificity. [*Journal of Current and Advance Medical Research, July 2023;10(2):65-69*]

**Keywords:** Breast lumps; fine needle aspiration cytology; FNAC

**Correspondence address:** Prof. Md. Abdul Quddus, Professor & Head, Department of Surgery, Ad-din Barrister Rafique Ul Huq Hospital & Bashundhara Medical College Dhaka, Bangladesh; **Email:** [drquddus246@gmail.com](mailto:drquddus246@gmail.com); **Cell No.:** +8801711902850;

**ORCID:** <https://orcid.org/0009-0002-2687-0744>

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**Introduction**

Fine needle aspiration cytology (FNAC) of the breast is a minimally invasive, safe, fast and cost effective technique which provides diagnostic information as to the nature of a breast lesion and can be used in appropriate settings to allow rapid management planning<sup>1</sup>. With the experience of exfoliative cytology in mind and with the knowledge that malignant cells were less cohesive than normal cells<sup>2</sup>. Needle aspiration cytology is a very simple procedure which can be performed in the Outdoor (OPD) without much discomfort to the patient. The result can be obtained more quickly than surgical biopsy.

FNAC is done to detect the nature of clinically palpable or suspicious lesions. It is effectively utilized as screening procedure in the Out Patient department in many places<sup>3-4</sup>. Aspiration cytology by an expert cytologist can reduce the number of operation for benign diseases<sup>5</sup>.

In Bangladesh FNAC has been carried out by several workers<sup>6</sup>. Their results are encouraging, so there is a scope of utilizing this procedure as a part of patient management protocol where appropriate facilities are available.

**Methodology**

**Study Settings and Population:** This cross sectional study was conducted with patients who were clinically diagnosed as breast lump and attended at the Out Patient department (OPD) and admitted in the department of surgery of Popular Medical College Hospital, Dhaka, Dhaka Medical College Hospital and Ad-din Barrister Rafique UL Huq Hospital from November 2021 to April 2022. The sample size of the study was 50 cases of breast lump patients, who were selected conveniently. This study was to find out the diagnostic accuracy and usefulness of FNAC in breast lumps.

**Study Procedure:** All the patients should have clinically palpable breast lumps. In every case clinical diagnosis was made by taking history and physical examination, cystic lumps were not included in this study and FNAC was done in every case. Finally, histopathological examination of all biopsied material was carried out after excisional biopsy or definitive surgical treatment.

**Data Collection Tools:** A semi structured questionnaire was used for face to face interview and an observation checklist was used for collection

of information by taking history, physical examination. The aspiration was done by myself, aspirates smeared on slides and numbering of slides were performed for future identification. Slides were sent to the pathology dept. Of DMC for staining and cytological examination and reports were collected. Finally, specimens were collected after excisional biopsy or definitive surgery and fixed with 10.0% formalin and sent to the pathology department of DMC for histopathological examination. Clinical diagnosis was grouped into malignant which was Hard lump, irregular in shape, fixed to the surrounding tissue, immobile or mobility restricted, skin involvement with peau d` orange, chest wall fixation, skin- ulceration, retracted nipple and blood stained discharge from nipple, palpable axillary lymph node and benign which was firm lump with regular margin, mobile, absence of palpable axillary lymph nodes, no ulceration or fungation. Borderline diagnosis could not be made vividly and suspicion of malignancy could not be ruled out.

**Classification of Smears:** Smears are classified according to microscopic finding unsatisfactory, Benign, Malignant, Atypical and suspicious of malignancy. Results were recorded in tabulated forms, data were processed accordingly and analyzed, and finding were focused with the tables. Terms to evaluate cytological diagnosis. Specificity was presence of benign lesions identified by FNAC (negative reports). Sensitivity was percentage of malignant lesions identified histologically (positive for malignancy). Accuracy was percentage of total lesions (benign or malignant) identified correctly

**Results**

**Table 1: Age Distribution of Patients (N=50)**

| Age Group      | Histological Diagnosis |           |
|----------------|------------------------|-----------|
|                | Benign                 | Malignant |
| 10 to 19 Years | 8(23.9%)               | 0(0.0%)   |
| 20 to 29 Years | 9(26.8%)               | 0(0.0%)   |
| 30 to 39 Years | 13(38.9%)              | 3(9.1%)   |
| 40 to 49 Years | 3(8.9%)                | 9(54.9%)  |
| 50 to 60 Years | 1(1.5%)                | 6(36.4%)  |
| <b>Mean±SD</b> | 33.8±5.2               |           |

Among 100 women with breast lumps, most benign lesions (38.85%) were below the age of 40 years and most of the malignant lesions (54.88%) were above the age of 40 years. The mean age of the patients was 33.8 years and standard deviation (SD± 5.2) (Table 1).

**Table 2: Clinical Diagnosis of Breast Lump**

| Clinical Diagnosis | Frequency | Percent      |
|--------------------|-----------|--------------|
| Benign             | 29        | 58.0         |
| Malignant          | 13        | 27.0         |
| Borderline         | 8         | 15.0         |
| <b>Total</b>       | <b>50</b> | <b>100.0</b> |

Clinically, 58% patients with breast lumps were benign, 27% lesions were malignant and remaining 15% cases were suspicious of malignant i.e. border line (Table 2).

**Table 3: Cytological Diagnosis of Breast Lump**

| Clinical Diagnosis    | Frequency | Percent      |
|-----------------------|-----------|--------------|
| Benign                | 30        | 60.0         |
| Malignant             | 13        | 26.0         |
| Suspicious Malignancy | 2         | 4.0          |
| Atypical              | 1         | 2.0          |
| Unsatisfactory Smear  | 4         | 8.0          |
| <b>Total</b>          | <b>50</b> | <b>100.0</b> |

Out of 50 breast lump patients, cytologically 30 (60%) were benign and 13 (26%) cases were diagnosed malignant, 2(4%) patients were found to suspicious of malignancy, 1 (2%) were atypical and 4 (8%) smears were unsatisfactory for cytological examination (Table 3).

**Table 4: Histological type of Malignant Lesions**

| Histological type         | Frequency | Percent      |
|---------------------------|-----------|--------------|
| Invasive ductal carcinoma | 24        | 75.0         |
| Intraductal carcinoma     | 3         | 12.5         |
| Lobular carcinoma         | 3         | 12.5         |
| <b>Total</b>              | <b>50</b> | <b>100.0</b> |

Table 4 showed that most of the malignant lesion as invasive ductal carcinoma 75.0% cases.

**Table 5: Comparison of Cytological and Histological Diagnosis**

| Cytological Diagnosis | Histological Diagnosis |            | Total     |
|-----------------------|------------------------|------------|-----------|
|                       | Benign                 | Malignant  |           |
| Benign                | 28(90.4%)              | 2(7.2%)    | 30        |
| Malignant             | 0(0.0%)                | 13(100.0%) | 13        |
| Suspicious Malignancy | 1(50.0%)               | 1(50.0%)   | 2         |
| Atypical              | 1(100.0%)              | 0(0.0%)    | 1         |
| Unsatisfactory        | 3(70.0%)               | 1(30.0%)   | 4         |
| <b>Total</b>          | <b>33</b>              | <b>18</b>  | <b>50</b> |

Comparison of cytological diagnosis with the final histological diagnosis showed that out of 28 benign lesions diagnosed cytologically 2 cases were found malignant histologically i.e. false negative in 2(7.20%). Around 13 malignant cases were diagnosed cytologically were confirmed histologically (i.e. no false positive was found). Out of 2 suspicious of malignancy cytologically reported 1 (50.0%) case was found benign and 1(50%) cases were malignant histologically and out of atypical cases reported cytologically 1 was benign (100%) and out of 4 unsatisfactory smears 3 (70.0%) cases were benign and 2 (30%) cases were malignant histologically (Table 5).

**Table 6: Sensitivity and Specificity of FNAC**

| Cytological Diagnosis | Sensitivity | Specificity |
|-----------------------|-------------|-------------|
| Malignant             | 85.3        | 100.0       |
| Benign                | 85.3        | 100.0       |

Only cases with a definitive diagnosis of benign and malignant were considered. The sensitivity of FNAC was 85.30% for the presence of malignancy and specificity 100% for absence of malignancy (Table 6).

**Table 7: Diagnostic Accuracy of FNAC**

| Cytological diagnosis | Total | Correct Diagnosis | Diagnostic accuracy |
|-----------------------|-------|-------------------|---------------------|
| Malignant             | 30    | 28                | 93.5                |
| Benign                | 13    | 13                | 100.0               |

Only cases with definitive diagnosis were considered. This study revealed that the negative predictive value of FNAC for benign breast tumor is 93.5% and positive predictive value for malignant breast tumor is 100%. The overall diagnostic accuracy is 95.4% (Table 7).

**Discussion**

Although benign breast lumps are six times more common than malignant breast lumps but presence of any persistence breast lump raises the questions of cancer. Breast cancer is the commonest cancer in women worldwide and comprises 18% of all female cancer that leading causes of death<sup>3</sup>. In the western countries the occurrence of breast cancer is one in 12 women and the incidence is gradually increasing<sup>4</sup>. Patients with a palpable breast lesion which is thought to be suspicious of malignancy should be investigated by FNAC and mammography<sup>5</sup>. FNAC is a diagnostic method which has been thoroughly validated in many

tissues including breast, lymph node, thyroid, salivary gland and other tissues. In essence the technique requires the insertion of a fine bore hole needle through which group of cells are withdrawn under negative pressure, cellular materials thus obtained is smeared on a slide and examined cytologically.

The principal objective of this study was to assess the value of FNAC in confirming the clinical diagnosis in cases of CA breast and preoperative diagnosis is important in the management of patients with breast cancer. FNAC can be performed as an Out Patient procedure without hazards of anesthesia. It is less traumatic, less expensive and yield results more quickly. It is a safe procedure with low complication rate. The accuracy of FNAC exceeds that of other preoperative diagnostic method and it provides better opportunity of treatment planning and more definitive counseling with the patient and her relatives. In this study, the slides were grouped into five categories benign, malignant, suspicious of malignancy, atypical and unsatisfactory smears. The clinical diagnosis was recorded as benign, malignant and borderline in which diagnosis was uncertain. The final diagnosis in each case by histopathological examination. In this study, cytological assessment showed 30 benign, 13 malignant, 2 suspicious of malignancy, 1 case was atypical and 4 were unsatisfactory for cytological examination.

All cases with cytological diagnosis of malignancy were confirmed by histological examination. So, there was no false positive cytologic diagnosis in this study. Histological examination in 30 cytologically benign lesions showed that 2 were malignant giving a false negative rate of 7.2%, 1 suspicious, atypical 1 cases were benign and 3 unsatisfactory smears also found malignant after histological examination.

Considering only the definitive diagnosis of benign and malignant, the sensitivity of this study was 85.3% for the presence of breast cancer and specificity was 100.0% for the absence of malignancy. The negative predictive value of this series for benign lesion was 93.5% and positive predictive value for malignancy was 100.0% and over all diagnostic accuracy was 95.4%. One previous study showed that sensitivity and specificity of breast FNAC in diagnosis of malignancy was 83.3% and 100.0% respectively<sup>6</sup>. Another previous studies had been shown that sensitivity of FNAC for the diagnosis of breast lump was ranging from 82.0% to 97.5% and

specificity of more than 99.0%<sup>7-9</sup>. So, FNAC should be used as a routine method for determining the nature of breast lump. In this study the sensitivity of FNAC was 85.3% for the presence of breast cancer and specificity 100.0% for the absence of breast cancer. The positive predictive value was 100.0% and negative predictive value was 93.5% and there was no false positive case. So, due to high diagnostic accuracy, FNAC can be used as a diagnostic method in the management of breast diseases which is reasonable sensitivity and specificity.

The cytological diagnosis is highly reliable when diagnosis of breast cancer is made. For negative and inconclusive cytological diagnosis, histological examination should be performed. Finally, FNAC is a quick procedure, has excellent patient compliance and accurate cost effective procedure that increases the diagnostic usefulness of breast lumps and initial discovery of lesion. This study was conducted in a small sample size. All these factors limit generalization of study results.

## Conclusion

Breast lump is a common surgical problem. This study was carried out to evaluate the effectiveness of FNAC as a diagnostic method. Fifty cases of clinically palpable breast lumps were subjected to FNAC. In all cases tissues were examined histologically after excision biopsy or definitive surgery. Results of FNAC were compared with histological diagnosis. Finally, it is a quick cost-effective procedure and has excellent patient compliance.

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## Conflict of Interest

The authors declare no conflicts of interest.

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## Data Availability

Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

## Ethics Approval and Consent to Participate

Ethical approval for the study was obtained from the Institutional Review Board. As this was a prospective study the written informed consent was obtained from all study

participants. All methods were performed in accordance with the relevant guidelines and regulations.

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**ORCID:**

Md. Abdul Quddus: <https://orcid.org/0009-0002-2687-0744>  
Nusrat Jahan: <https://orcid.org/0009-0001-7392-7494>  
SM Syeed-UI-Alam: <https://orcid.org/0009-0003-8639-6033>  
Semonty Jahan: <https://orcid.org/0009-0001-3882-5791>  
Adneen Moureen: <https://orcid.org/0000-0001-8732-6481>

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