

A Hospital Based Comparative Evaluation of the Diagnostic Accuracy of FNAC with Histopathology in Benign and Malignant Breast Lumps

Shambhwi Sharma

Senior Resident, Department of Pathology, AIIMS, Patna, Bihar, India

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Corresponding author: Dr. Shambhwi Sharma

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Abstract

Aim: The aim of the present study was to compare the diagnostic accuracy of fine needle aspiration cytology (FNAC) and with histopathological correlation in patients with detectable breast lesions.

Methods: The study was conducted in the Department of Pathology, AIIMS, Patna, Bihar, India for a period of two years. During this period, 120 fine needle aspiration were performed for various breast lumps. Out of these, 60 patients underwent surgery and form the material of the study.

Results: A total of 60 patients presenting with palpable breast lumps were included in this study. The maximum number of patients attended were in 41–50 years of age group (18 cases, 30%), followed by 51–60 years (25%) with mean age of the patient was 46.93 years. The maximum number of benign lesions (12 in number) occurred in 31–40 years of age group and the maximum number of malignant lesions (18 in numbers) occurred in 41–50 years of age group. In FNAC, 57 cases were labelled as benign and 3 cases were malignant. Out of the 60 cases, 40 patients had fibroadenoma, 2 patients had phylloid tumor, 1 tubular adenoma, 3 fibrocystic disease of breast, 4 patients had inflammatory or breast abscess, 2 patients had gynaecomastia and in 2 cases no opinion was given. Out of the 4 malignant cases in HPE, 2 patients had a diagnosis of ductal cell carcinoma and 4 patients infiltrating ductal carcinoma.

Conclusion: Fine needle aspiration cytology is a comfortable, easy, reliable, rapid and simple diagnostic test. The FNAC of breast lump should be used with” triple test” for preliminary investigation in outdoor patient department, which will further enhance the diagnostic accuracy of breast lumps.

Keywords: Fine Needle Aspiration Cytology, Breast Lump, Histopathology.

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Introduction

Breast lump is one of the commonest surgical problems encountered in female patients. A breast tumor is an abnormal mass of tissue in the breast as a result of neoplasia. The most common breast tumour is fibroadenoma which is a benign

condition. Malignant masses include ductal cell carcinoma, lobular cell carcinoma. The method for diagnosis of breast masses involve “Triple Test” which consists of clinical examination, mammography and FNAC. [1] Biopsy of

the breast lump is considered the benchmark for the diagnosis of breast lump. The aim of conducting biopsy is to demonstrate a final diagnosis of breast mass prior to surgery. Biopsy of the breast lump is a minor surgical procedure done under local anaesthesia or general anaesthesia with post-operative morbidity included. The main purpose of fine needle aspiration cytology (FNAC) of breast lump is to confirm cancer preoperatively and to avoid surgery in form of biopsy for specific benign conditions. The cost factor is also taken into the account, given the large volume of work generated by breast cancer screening. [2]

Due to increasing incidence, morbidity and mortality of breast cancer is the commonest malignant tumour responsible for 18.4% of all female cancers worldwide. [3] As it is the leading cause of death from cancer in women, [4,5] the major concern of the surgeon and the responsibility of the surgical pathologist lies in the ability to differentiate a benign from a malignant lesion. Although open surgical biopsy is the 'gold standard' for diagnosis of palpable breast lesions, in recent years two types of minimally invasive breast biopsy techniques, core needle biopsy (CNB) and fine needle aspiration cytology (FNAC), have become established for the diagnostic evaluation of palpable breast lesions. [6] A triple test consisting of clinical examination, mammography and FNAC is considered the gold standard in making a definitive assessment of breast lumps. [7]

Biopsy of the breast lump is a minor surgical procedure done under local anaesthesia or general anaesthesia with post-operative morbidity included. The main purpose of fine needle aspiration cytology (FNAC) of breast lump is to confirm cancer preoperatively and to avoid surgery in form of biopsy for specific benign conditions. The cost factor is also taken into the account, given the large

volume of work generated by breast cancer screening.

The aim of the present study was to compare the diagnostic accuracy of fine needle aspiration cytology (FNAC) and with histopathological correlation in patients with detectable breast lesions.

Methods

The study was conducted in the Department of Pathology, AIIMS, Patna, Bihar, India for a period of two years. During this period, 120 fine needle aspiration were performed for various breast lumps. Out of these, 60 patients underwent surgery and form the material of the study. The FNAC was carried out using 23 Gauge needle and 10 ml disposable syringe for aspirating the material from the breast lump. Three or four dry clean slides were used for preparing the smear. The slides were labelled with glass pencil and were air dried. The cytological smears were fixed in 95% alcohol and stained with Haematoxylin and Papanicolaous stains. The surgical specimens for histopathological examination were fixed in 10% formal saline. The grossing and the cut section findings were noted. Several sections were taken from appropriate sites for processing and paraffin embedding. The section from each block were cut in 04 micron thickness and stained with Haematoxylin and Eosin.

Technique and patient preparation

The Patient was explained about the FNAC procedure in complete detail. The procedure was performed without any anaesthesia by a trained pathologist. The lump over the doubtful area was cleaned with spirit, the lump was palpated with hand and fixed. The plunger of the needle was retracted and many passes were done till the sufficient material was obtained in the needle hub. The air was draw out in the syringe and after attaching the needle, the aspirated material was scattered on the glass slide and the smear was made.

The smear was fixed with 95% alcohol and later stained with haematoxylin and eosin. The slides were seen under the microscope and graded accordingly.

Results

Table 1: Age distribution

Age (years)	Number of cases, N (%)
≤30	8 (13.34)
31-40	12 (20)
41-50	18 (30)
51-60	15 (25)
61-70	7 (11.66)
Total	60

A total of 60 patients presenting with palpable breast lumps were included in this study. The maximum number of patients attended were in 41–50 years of age group (18 cases, 30%), followed by 51–60 years (25%) with mean age of the

patient was 46.93 years. The maximum number of benign lesions (12 in number) occurred in 31–40 years of age group and the maximum number of malignant lesions (18 in numbers) occurred in 41–50 years of age group.

Table 2: Distribution of cases in FNAC

FNAC	Frequency, N (%)
Fibroadenoma	36 (60%)
Fibrocystic disease of breast	2 (3.34%)
Breast abscess	4 (6.66%)
Benign breast disease	12 (20%)
Malignant	3 (5%)
Fibrofatty tissue	3 (5%)
Total	60 (100%)

In FNAC, 57 cases were labelled as benign and 3 cases were malignant (distribution of cases as per Table 2).

Table 3: Distribution of cases in HPE

Histopathology	Frequency, N (%)
Fibroadenoma	40 (66.66%)
Fibrocystic disease of breast	3 (5%)
Breast abscess	4 (6.66%)
Gynecomastia	2 (3.34%)
Phylloid tumor	2 (3.34%)
Tubular adenoma	1 (2%)
Ductal cell carcinoma	2 (3.34%)
Infiltrating ductal carcinoma	4 (6.66%)
No Opinion	2 (3.34%)
Total	60 (100%)

Out of the 60 cases, 40 patients had fibroadenoma, 2 patients had phylloid tumor, 1 tubular adenoma, 3 fibrocystic

disease of breast, 4 patients had inflammatory or breast abscess, 2 patients had gynaecomastia and in 2 cases no

opinion was given. Out of the 4 malignant cases in HPE, 2 patients had a diagnosis of ductal cell carcinoma and 4 patients infiltrating ductal carcinoma. Benign lesions involved patients in second & third decades of life. The malignant lesions were reported in fifth and seventh decades. The most common benign lesion was fibroadenoma with maximum incidence in second & third decades and followed by

breast abscess and then fibrocystic disease of breast with maximum incidence in fourth decade. In the malignant cases, the most common was infiltrating ductal cell carcinoma with maximum incidence in fifth & sixth decades. The correlation between FNAC and histopathological examination for the sensitivity, specificity and positive predictive value were calculated.

Table 4: Percentage of benign and malignant cases in FNAC

Cytopathology	Frequency (%)
Benign	56 (93.34%)
Malignant	4 (6.66%)
Total	60 (100%)

The cytohistological correlation of 60 patients, out of which 4 patients has the final diagnosis of malignancy and 56 patients had benign condition.

Table 4: Percentage of benign and malignant cases in FNAC

Histopathology	Frequency (%)
Benign	55 (91.66%)
Malignant	5 (8.34%)
Total	60 (100%)

The histopathological correlation of 60 patients, out of which 5 patients has the final diagnosis of malignancy and 55 patients had benign condition.

Discussion

The earliest large scale use of Fine Needle aspiration Cytology FNAC as a diagnostic tool in the management of palpable masses was recorded in Memorial Hospital, New York, United States in the 1930s but it did not gain much encouragement in United States during the ensuing years. The technique had resurgence in Scandinavia during the 1950s and 1960s, where it flourished before spreading to other parts of the world. [8]

True FNAC for breast aspirations were first introduced in the beginning of 1960s by Franzen and Zajicek at the Karolinska Hospital in Stockholm. [9] Being an oncologist, Franzen introduced standard May-Grunwald Giemsa stains on air-dried

smears to allow for rapid interpretation. Despite their success, it was not until 1980s that FNAC became widely used. The reasons included lack of confidence in the sensitivity and specificity of the procedure, fear of tumour implantation in the needle track, lawsuits, and surgeons not willing to relinquish the use of histological biopsy technique. [10]

The “ideal” method of biopsy to diagnose breast cancer is debatable and should depend on the expertise available in the unit, as well as the physical characteristics of the lump. FNAC is a reliable and relevant method for the pathological diagnosis of breast carcinoma in a developing nation like Malaysia. It is highly useful as an initial method of pathological assessment for palpable breast lumps. If the initial FNAC is inadequate, CNB can be a useful second line method of pathological diagnosis. Excision biopsy should be the last option to obtain a pathological diagnosis. [11]

The aspiration cytology was correlated with the histology report to see accuracy of fine needle aspiration cytology with open biopsy/Lumpectomy HPE specimen. The results were tabulated and conclusion drawn based on statistical study.

Pinto et al. carried out 58 FNACs of breast with subsequent histopathology, the youngest patient was 12 years old & the oldest patient was 82 years old. In their study fibroadenoma was the most common benign lesion in female and gynecomastia was the most common lesion in male. [12] In the present study, our observation is similar, the fibroadenoma being common in female (60%) and gynecomastia being common in male.

In another study done by Yalavarti S, 56 patients were studied with cytopathological correlation, of which benign lesion, 45% were reported in third decade and the maximum number of malignant lesion 44% were reported in fifth decade. Our study shows benign lesions 92% reported in second to third decade and the malignant lesion 08% were reported in fifth to sixth decade. [13] Many authors suggest different reporting protocols in classifying the breast lesions. In one of the study done by Ishita classification of the lesions were into four groups i.e benign, malignant, suspicious and inadequate. [14]

In our study, two cases in FNAC show fibrocystic disease of breast turned out to be malignant in biopsy. Similar observations were found in study done by Hamed H, Coady et al. on 401 women presenting with breast lumps. [15] Most of the breast lesions are benign and need reassurance to the patient to prevent anxiety and discomfort. Therefore, FNAC is very highly accurate in diagnosing benign lesions and hence surgery can be avoided in such cases for HPE. [16,17,18]

Conclusion

The diagnostic procedure known as fine needle aspiration cytology is one that is

painless, uncomplicated, quick, and reliable. In order to further improve the diagnostic accuracy of breast lumps, it is recommended that the FNAC of breast lump be used in conjunction with the "triple test" for preliminary examination in the outpatient department of the hospital. Aspirate from the FNAC may also be utilised for further molecular testing if necessary.

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