



FNAC AS A PRIMARY DIAGNOSTIC TOOL IN BREAST LUMP - A STUDY IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Benign breast diseases constitute a heterogeneous group of lesions including developmental abnormalities, inflammatory lesions, epithelial and stromal proliferations, and neoplasms (1). A considerable proportion of breast lumps are not malignant and therefore it is important to establish the correct diagnosis before embarking for definite treatment. Aim: The aim of this study was a) to establish the use of fine needle aspiration cytology (FNAC) as a primary diagnostic tool in cases of benign breast lumps, b) to compare the cytologic diagnosis with the histopathological diagnosis and c) To find out the cause of false positive and false negative results. Methods: Present study of 'FNAC of breast lesions' was carried out in a tertiary care institute and 346 cases of benign breast lesions were studied. Detailed history and clinical findings including general, local and systemic examination were noted. Cytomorphologic features of the breast lesions were studied in detail and correlated with clinical and histological features. Observations were noted down under various parameters. Results: The maximum number of patients was seen in the age group of 21-30 years (136 cases). The most common cytological diagnosis was fibroadenoma (245 cases). Conclusion: FNAC is a rapid, simple, reliable and economic tool with excellent acceptance by the patients.

KEYWORDS : FNAC, Fibroadenoma, Fibrocystic disease Tuberculous mastitis, Benign breast disease

Introduction

The vast majority of the lesions that occur in the breast are benign⁽¹⁾. Surgical intervention in the form of incisional or excisional biopsy involves preoperative preparation of patients, hospitalization and anesthesia. It is followed by scarring which alters the consistency and optical density of breast interfering with the radiological follow up⁽²⁾. To overcome these difficulties and to fill the gap in the diagnostic evaluation of the breast lesions, fine needle aspiration cytology (FNAC) was introduced by Martin and Eliis in 1930 in New York⁽³⁾. FNAC is a rapid, simple, reliable and economic technique with excellent acceptance by patients. This technique provides a representative sample for microscopic examination without interfering with the radiological appearance of the breast⁽⁴⁾. The primary goal of aspiration cytology is to separate malignant lesions that require more radical therapy from benign ones that may be conservatively managed.

Guray and Sahin in their review have summarized the most frequently seen benign lesions of the breast are as developmental abnormalities, inflammatory lesions, fibrocystic changes, stromal lesions, and neoplasms⁽¹⁾.

Aims and Objectives

1. To establish the use of fine needle aspiration cytology (FNAC) as a primary diagnostic tool in cases of benign breast lumps
2. To compare the cytologic diagnosis with the histopathological diagnosis
3. To find out the cause of false positive and false negative results.

Materials and Methods

Material

The present study was carried out in a tertiary care institution over a period of 3 years. The study comprised of 346 cases of benign breast diseases. The female patients of benign breast diseases attending the surgical OPD were included in this study. The patients with malignant breast lumps clinically suspected or diagnosed by ultrasonography or mammography were excluded from the study. Their Clinical History, Symptomatology, General, Systemic and Local examination findings were noted down in a pre-validated proforma.

Equipment

1. Needles - Standard disposable 22 or 23 gauge needles with a 2.5 to 3.8 cm length.
2. Syringes - 10 to 20 ml disposable syringes

3. Slides - Clean glass slides free of grease.
4. Fixative - Ethyl alcohol and ether mixture in proportion of 50:50 was used as fixative for the slides to be stained by H and E or PAP staining.
5. Test tubes for fluid aspirate
6. Others - Alcohol swabs, adhesive dressing etc.

Method

FNAC procedure was explained to the patients in their local language and written consent was taken.

FNAC of these breast lesions were done by the standard technique. Needle contents were smeared over the glass slides. The smears of the aspirated material were made. In case of cystic swellings, the cyst contents were aspirated centrifuged and the slides were made from the sediment for the cytological analysis. The slides were carefully labeled, few slides were air dried. Slides for H & E and PAP smear were immediately put into fixative. The air dried smears were stained with MCG stain directly. The slides were mounted in DPX medium and examined under the microscope. Cytomorphologic features of the smears were studied in detail. The surgical specimens were sectioned. Paraffin blocks of the sections were made. Slides of the paraffin blocks were made and stained with haematoxylin and eosin stain. FNAC results were compared with histopathological diagnosis.

The findings were studied under the following parameters

1. Age wise distribution
2. Quadrant wise distribution
3. Side wise distribution
4. Cytomorphologic features
5. Cytologic and Histologic Correlation
6. False positive and False negative results

Observations

1. Age wise distribution

| Age in years | No of cases | Percentage (%) |
|--------------|-------------|----------------|
| 10 to 20 | 87 | 25.14 |
| 21 to 30 | 122 | 35.26 |
| 31 to 40 | 86 | 24.85 |
| 41 to 50 | 33 | 9.53 |
| 51 to 60 | 11 | 3.17 |

| | | |
|----------|-----|------|
| 61 to 70 | 05 | 1.44 |
| 71 to 80 | 02 | 0.57 |
| Total | 346 | |

Table.1 Shows age wise distribution of benign breast lesions. Majority of patients were in the age group 21 to 30 years. The youngest patient being 12 years old

2. Quadrant wise distribution

| Quadrant | No. of cases | Percentage (%) |
|---------------|--------------|----------------|
| UOQ | 183 | 52.89 |
| UIQ | 56 | 16.18 |
| LOQ | 39 | 11.27 |
| LIQ | 11 | 3.17 |
| Central | 32 | 9.24 |
| All quadrants | 25 | 7.22 |
| Total | 346 | |

Table.2 shows quadrant wise distribution of breast lesions. Upper quadrant was the commonest site.

- Side wise distribution - In the present study 167 (48.26%) breast aspirates were from the left breast and 154 (44.50%) from the right breast and 25 (7.22%) were bilateral.
- Cytomorphologic features

| Sr. No. | Benign lesions | Total | Percentage (%) |
|---------|-------------------------|-------|----------------|
| 1 | Galactocele | 01 | 0.31 |
| 2 | Fat necrosis | 03 | 0.94 |
| 3 | Lactational change | 03 | 0.94 |
| 4 | Tuberculous mastitis | 06 | 1.89 |
| 5 | Simple cyst | 07 | 2.20 |
| 6 | Abscess | 21 | 6.62 |
| 7 | Fibrocystic disease | 30 | 8.67 |
| 8 | Fibroadenoma | 245 | 77.28 |
| 9 | Benign phyllodes tumour | 01 | 0.31 |
| | Total | 317 | |

Table 3 shows cytological morphologic diagnosis of the benign breast smears

- Cytologic and Histologic Correlation
- False positive and False negative results

| Sr. No | Category | No. of Cytologic diagnosis | No of Histologic Biopsy | No. of Histologic Diagnosis correlation | False positive | False negative |
|--------|-------------------------|----------------------------|-------------------------|---|----------------|----------------|
| 1 | Inadequate | 29 | - | - | - | - |
| 2 | Galactocele | 01 | - | - | - | - |
| 3 | Fat necrosis | 03 | 02 | 02 | - | - |
| 4 | Lactation change | 03 | - | - | - | - |
| 5 | Tuberculous mastitis | 06 | 06 | 06 | - | - |
| 6 | Simple cyst | 07 | - | - | - | - |
| 7 | Abscess | 21 | - | - | - | - |
| 8 | Fibrocystic disease | 30 | - | - | - | - |
| 9 | Fibroadenoma | 245 | 127 | 125 | - | 02 |
| 10 | Benign phyllodes tumour | 01 | 01 | 01 | - | - |
| | Total | 346 | | | | |

Table 4 shows Cytologic and Histologic correlation of the Benign breast Lumps and False positive and False negative cases

Discussion

In the present study 346 patients with benign breast lumps were subjected to fine needle aspiration.

The minimum age of the patient was 12 years and the maximum was 79 years. Breast tumours were found to be very rare in the first decade of life and out of all the cases in young age only 0.3% are below 10 years of age⁽⁶⁾. There was no case in the first decade of life in our study. The rarity of breast disease in the first decade of life is reported by other authors also^(7, 8). Of the 346 cases, 241 (69.65%) cases were observed in second to fourth decade of life. In the series of Khanna et al⁽⁶⁾, the patients below 40 years of age were 55.76%. The breast diseases are common during adolescent and reproductive age groups as major hormonal changes produce alteration in mammary tissue.

The most common site of breast lesions was upper outer quadrant (52.89%) followed by upper inner quadrant (16.18%). In the study of Zuk et al⁽⁷⁾, the percentage of breast lesions in upper outer quadrant and upper inner quadrant were 42.2% and 6.4% respectively.

In the present study 48.26% breast aspirates were from the left breast and 44.50% from the right breast. Our findings correlate well with the findings of Zuk et al⁽⁷⁾.

In this study all aspirate were classified in 2 categories. Even after repeating the procedure as required, the fine needle aspirate remained inadequate in 29 cases (8.38%) out of 346 cases of the benign breast lesions. Zuk et al in the study of 134 solid breast lesions reported 44 (8%) aspirates as inadequate. The adequacy of the aspirate depends on the experience of the aspirator and the size of the tumour. Tumours less than 2cm. in maximum dimension are associated with inadequate aspiration^(8,7). The inadequate rate in our series was 8.38% which was below the recommended target of less than 25%. We excluded inadequate smears from further analysis.

Of the 317 adequate smears, 245 cases were of fibroadenoma (Photograph 1,2,3). Out of the 245- cases of fibroadenoma, 1 case was of fibroadenoma with multinucleated stromal giant cells (Photograph 4). Fibroadenoma with multinucleated stromal giant cells is a histological rarity. A very few such cases with histologic findings have been described in literature^(9,10,11). These giant cells are thought to be stromal specifically fibroblastic in nature^(9,10). Some authors have suggested that they are epithelial in origin and related to epithelial degeneration. Lanjewar et al⁽¹²⁾ also reported one case of fibroadenoma with multinucleated stromal giant cells. Of the 245 cases of fibroadenoma, histologic diagnosis was available in 127 cases. The cytologic diagnosis correlated in 125 cases. The remaining 2 cases turned out to be malignant on histology. Thus these two cases were false negative. According to Willis & Ramzy⁽¹³⁾ false negative rate is due to a high number of breast aspirates performed by clinical staff without immediate evaluation of specimen adequacy. The majority of the false negative diagnosis in breast lesions is due to sampling error⁽¹⁴⁾. The lesions may be small, fibrosed or necrosed and therefore yield of cells may be low. Nonetheless, a significant negative diagnosis is due to interpretative errors⁽¹⁵⁾. False negative cytology occurs due to poor diagnostic quality eg. Error of interpretation and unsatisfactory aspirate. In literature the rate of false negative result ranges from 0-35%, such errors are caused in the interpretation of adequate cellular material⁽¹⁶⁾.

There were no false positive cases in our study. However review of literature showed that the false positive diagnosis ranged from 0.6 to 4%^(17,18,19,20,21,22,23).

Other benign lesions encountered in the study were galactocele 1 cases, fat necrosis 3 cases (Photograph 5), Lactational change 3 cases, Tuberculous mastitis 6 cases, simple cyst 7 cases (Photograph 6), abscess 21 cases (Photograph 7), fibrocystic disease 30 cases

(Photograph 8) and benign phyllodes tumour 1 cases(Photograph 9).

We encountered 1 case of benign phyllodes tumour. The tumour showed biphasic fibroepithelial proliferation, where the stromal component shows phyllodes fragments i.e. highly cellular stromal fragments. The diagnosis of phyllodes tumour is favoured over fibroadenoma when many PFSR are present⁽²⁴⁾.

The present study showed 6 cases of granulomatous mastitis. Histologic diagnosis of all 6 cases showed features of tuberculosis. We encountered 3 cases of fat necrosis which showed the presence of abundant foamy cells which is a classic feature.

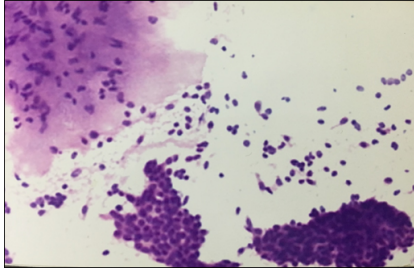


Figure 1- Fibroadenoma showing cohesive sheets of ductal epithelial cells, bipolar naked nuclei and myxomatous stroma. H & E, 200X

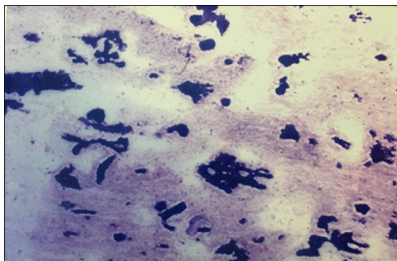


Figure 2- Fibroadenoma showing staghorn pattern. H & E, 100 X

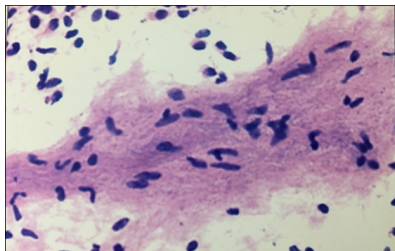


Figure 3 - Fibroadenoma showing fibrous connective tissue stroma. H & E 400 X

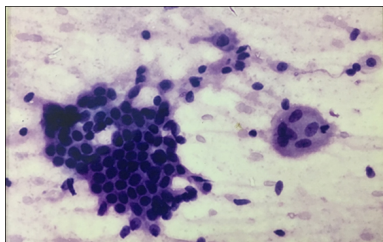


Figure 4 - Fibroadenoma with giant cells, showing ductal epithelial cells, bare bipolar nuclei and stromal giant cells. H & E, 400 X

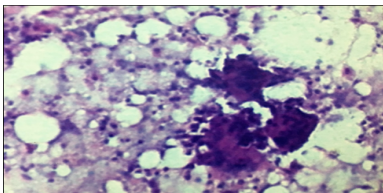


Figure 5 - Showing foreign body type of giant cell, lymphocytes, histiocytes against a background of granular debris and fat. Note absence of epithelial cells, suggestive of fat necrosis H & E, 400 X

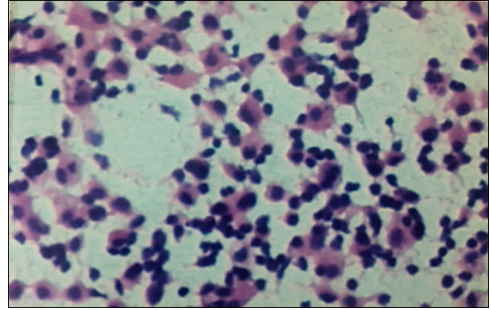


Figure 6- Showing predominantly cyst macrophages. Suggestive of simple cyst H & E, 400 X

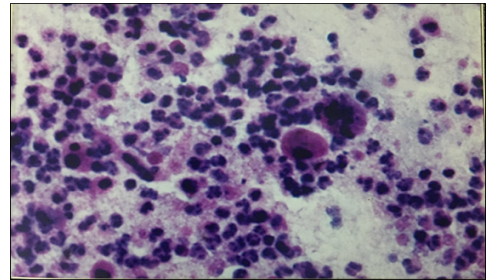


Figure 7- Showing suppurative inflammatory lesion. Smear shows predominantly neutrophils, lymphocytes and histiocytes, H & E 400 X

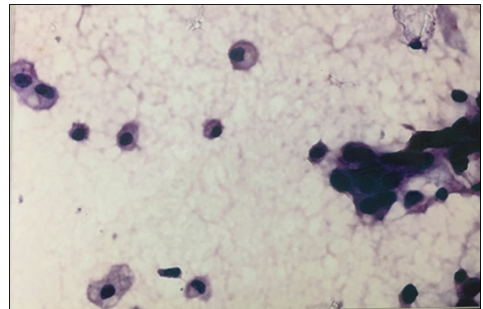


Figure 8- Fibrocystic disease shows sheets of ductal epithelial cells and cyst macrophages. H & E, 400 X

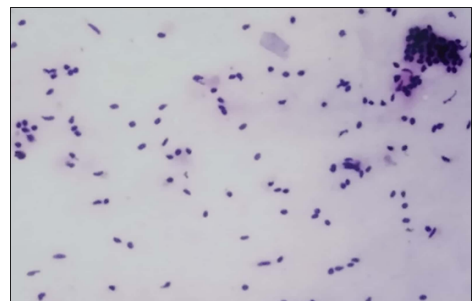


Figure - Benign phyllodes tumour showing cellular smear with large component of dispersed bare oval nuclei and relative paucity of ductal epithelial cells, H & E, 200 X

Summary

Fine needle aspiration cytology is a useful technique for evaluation of patients with breast lesions because of its lack of complications and excellent results. It is quick and can be employed at the bedside as well in the out patient department. Benign breast lesions affect the females in the early age group. The most common benign breast

lesion found in our study is fibroadenoma.

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