International Journal of Medical and Health Research
ISSN: 2454-9142
www.medicalsciencejournal.com
Volume 4; Issue 8; August 2018; Page No. 168-171

Cytomorphological spectrum of breast lesions diagnosed by fine needle aspiration cytology

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Abstract

Background: Breast lumps are the most common presentations in outpatient departments due to growing awareness in the general population. In Indian women breast carcinoma is the second most common malignancy encountered preceded by cervical cancer. Hence for early detection it is important to distinguish non-neoplastic from neoplastic breast lesions prior to definitive management. The global protocol of "Triple Assessment" in breast lump diagnosis includes a combined approach by clinical examination, imaging (mammography / ultrasound) and fine needle aspiration cytology (FNAC).The aim of the study was to analyses the cytomorphological spectrum of palpable breast lesions in female patients by FNAC and subsequently compare our results with published studies in literature.

Materials and methods: The present study was conducted in the department of Pathology for the period of one year in female patients with palpable breast lesions attending the outpatient department as well as the indoor admissions. The detailed history of the patient including age, site and duration of palpable breast lumps with any other significant findings was noted.

Results: Considering the cytomorphological spectrum, out of 60 breast lump aspirates, neoplastic breast lesions (81.6%) were more common than non-neoplastic breast (18.3%) lesions. In the neoplastic category, the benign lesions of fibro adenoma were 34 cases (66.6%) which were more than malignant tumors of ductal carcinoma (15 cases=25%). The most common affected age group was 21-30 years accounting for 19 cases (31.6%).

Conclusion: FNAC of palpable breast lumps is a quick to perform, patient friendly, cost effective and reliable diagnostic tool which if performed and interpreted accurately can obviate the need for another surgical biopsy prior to definitive surgery for malignancy.

Keywords: palpable breast lumps, females, fine needle aspiration cytology

Introduction

Breast pathologies have a varied spectrum and range from developmental abnormalities, inflammatory lesions, and benign epithelial and stromal proliferations to various malignant neoplasms. The clinical presentation of these lesions encompasses a wide range of symptoms, the most common being palpable lumps or they may be incidental detection [1, 2]. In Indian women breast cancer is the most common and leading cause of cancer related deaths preceded by cervical cancer, comprising 22.2% of all cancer diagnosis and 17.2% of all cancer related deaths [3, 4]. The worldwide-accepted protocol for diagnosis of breast lumps is the "Triple Assessment" which encompasses the triad of clinical examination, mammography and pathological diagnosis. Fine needle aspiration cytology (FNAC) has gained importance as a diagnostic tool to assess the nature of palpable breast lumps due to its cost effectiveness, patient friendly procedure, simplicity, rapidity and its ability to display the abnormal cellularity along with nuclear & cytoplasmic details [3, 5, 6, 7]. FNAC has a good sensitivity, specificity and accuracy in the diagnosis of both neoplastic and non-neoplastic breast lumps thereby assisting in early diagnosis and further management. [8]. The present study was undertaken to study the incidence and the different cytomorphological patterns of palpable breast lesions in female patients by FNAC and subsequently compare the results with other published studies in literature.

Materials and methods

The present study was conducted in the Department of Pathology of a tertiary care hospital for the period of one year. The aim of the study was to analyses the cytomorphological spectrum of breast lesions on Fine needle aspiration cytology (FNAC) in female patients. A total of 109 FNACs were done out of which 60 cases were from palpable breast lumps in female patients attending the outpatient department as well as the indoor admissions. The detailed history of the patient including age, site and duration of palpable breast lumps with any other significant findings was noted.

Inclusion Criteria

All female patients presenting with palpable breast lumps.

Exclusion Criteria

Female patients not willing for the procedure and Male patients with palpable breast lumps.

Equipments used

Syringes: The routine 10 cc single-use disposable plastic syringes were used for performing the procedure by aspirating the material from the palpable breast lumps.

Slides
At least three to four labeled dry clean slides were used for preparing the smears.

Needles
Number 23 fine gauge, disposable needles were used in the present study in all patients

Fixatives
As per the protocol, routinely all smears were fixed with 95% alcohol. In few particular cases slides were air-dried for special stains if required.

Stains
All the slides were stained with hematoxyline and eosin stain. Special stains like Ziehl Neelson (ZN) were used in few particular cases if required.

Technique
The breast was examined and lump was palpated. The suspicious area was cleaned with spirit. The skin over the lump was stretched, lump was stabilized with one hand and multiple passes at different angles were made in the lump with a 10 cc disposable plastic syringe fitted with a 23 G disposable needle till sufficient material was obtained in the needle hub. The axillary swellings if present and palpable were also aspirated in the similar manner. The aspirated material was sprayed and smeared on the properly labelled glass slides which were submitted for staining as per the protocol. The stained smears were then submitted for microscopic examination and cytology reports were interpreted accordingly.

Results
During the study period, a total of 109 FNACs were performed out of which 60 were from breast lump, all in female patients. The patient's age ranged from 12 to 89 years with median age of 56.5 years. The most common affected age group was 21-30 years comprising of 19 cases (31.6%) followed by 41-50 years having 10 cases (16.6%) (Table1). There was slight preponderance in right breast involvement (45 %) followed by left breast involvement (43.3%) and bilaterality was seen in 7 cases (11.6%) (Table2). Breast lumps were commonly seen in upper outer quadrant in 28 cases (46.66%) followed by upper inner quadrant 17 cases (28.33%).
Considering the cytomorphological spectrum (Table 3), neoplastic breast lesions (81.6%) were more common than non-neoplastic breast (18.3%) lesions. In the neoplastic category, the benign neoplastic lesions (34 cases) (66.6%) were more than malignant tumors (15 cases) (25%).Benign neoplastic lesions were all fibroadenomas (Fig 1). In our case study, 4 cases of fibroadenoma showed cystic change (Fig 2). In malignant category, all the cases (15 cases) (25%) were of ductal carcinoma (Fig 3) out of which 3 cases showed axillary lymph node metastasis. In non-neoplastic category, total 11 cases (18.3%) were observed out of which most commonly found was fibrocystic disease (7 cases) (11.6%). In the inflammatory category of breast lesions, 1 case of acute mastitis (1.6%) (Fig 4) and 2 cases of granulomatous mastitis (3.3%) (Fig 5) were found. We also observed 1 case of galactocele (1.6%) in a postpartum female.

Table 1: Breast lesions FNAC: Age distribution

Age Group (years)	Number of cases	Percentage (%)
11-20	08	13.33
21-30	19	31.66
31-40	12	20
41-50	10	16.66
51-60	04	6.66
61-70	03	05
71-80	03	05
81-90	01	1.66

Table 2: Breast lesions FNAC: Side distribution

	right breast	left breast	Bilateral
Number of Cases	27 (45%)	26 (43.33%)	07 (11.66%)

Table 3: Breast lesions FNAC: Cytomorphological spectrum

Breast lesions	No. of cases	Percentage (%)
Non-neoplastic breast lesions	11	
Acute mastitis	01	1.66
Granulomatous mastitis	02	3.33
Galactocele	01	1.66
Fibrocystic disease	07	11.66
Neoplastic breast lesions	49	
Benign (fibroadenoma)	34	56.66
Malignant (ductal carcinoma)	15	25

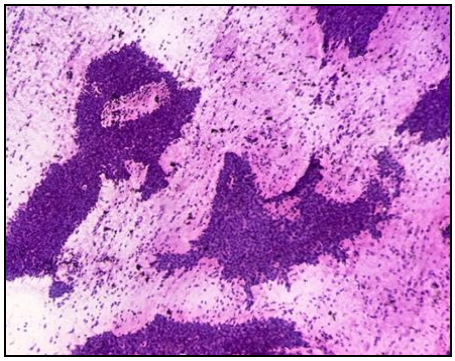

Fig 1: Fibroadenoma, smear showing tight cohesive clusters of benign ductal epithelial cells with scattered bare bipolar nuclei. (HxE stain 100X)

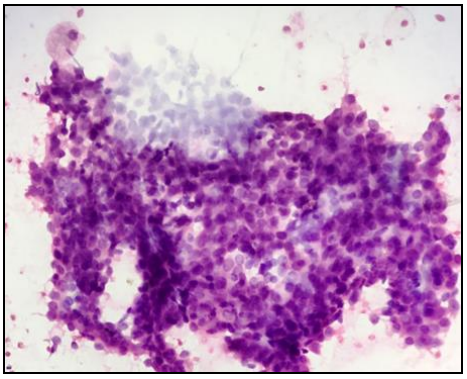

Fig 2: Fibroadenoma with cystic change, smear showing tight cohesive cluster of benign ductal epithelial cells with myoepithelial cells and cyst macrophages. (HxE stain 400X)

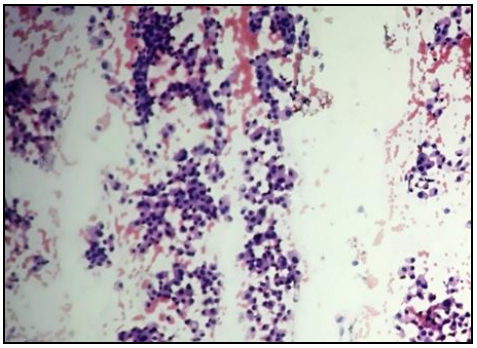

Fig 3: Ductal carcinoma, smear showing loose clusters of pleomorphic ductal epithelial cells. (HxE stain 100X)

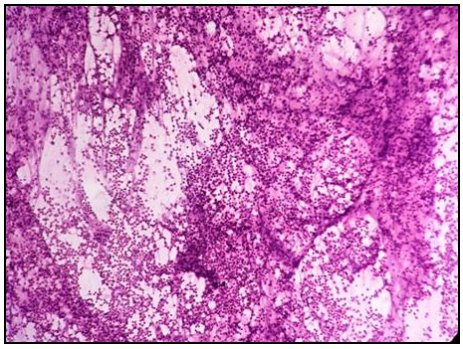

Fig 4: Acute mastitis, smear showing numerous neutrophils. (HxE stain 400X)

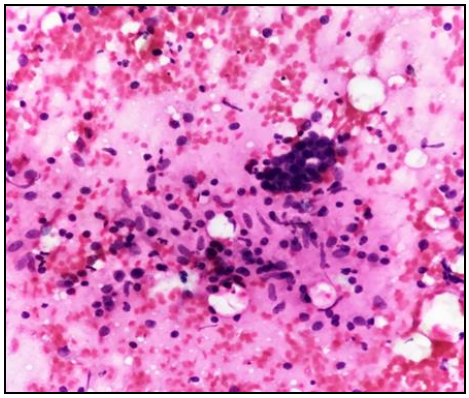

Fig 5: Granulomatous mastitis, smear showing epithelioid cell granuloma. (HxE stain 400 X)

Discussion

Fine needle aspiration cytology of breast lump is a simple, safe, cost effective and time saving procedure [3]. In the present study, we included 60 breast lump cases, all in female patients, accounting to 55.04%. The inadequate samples were excluded from the study. The cytomorphological study was performed and cytological diagnoses were done following laid down criteria. The breast lump complains were seen in wide age range. In our study, youngest patient was 12 years old and oldest was 84 years old female. The majority of the cases with palpable breast lumps occurred in females in third to fifth decades of life which correlated with studies by Chamdanwale *et al*. [9] & Likhar *et al*. [10] In our study, there was slight preponderance in right breast involvement (45 %) followed by left breast involvement (43.3%) while study by Faiyaz Ahmed *et al*. [3] showed left side involvement more common. The common site in present study was upper outer quadrant which was in accordance with previous studies in literature [11, 12].

In the present study, fibroadenoma was the most common benign lesion and maximum cases of fibroadenoma were observed in the age group of 21-30 years which was in accordance with results shown by Faiyaz *et al*. [3] Kochhar *et al*. [13], Khanzada *et al*. [14], Iyer *et al*. [15], Akhtor *et al*. [16] & Irabor *et al*. [17]. In malignant category, all the cases (25%) were of ductal carcinoma (Fig 3) out of which 3 cases showed axillary lymph node metastasis while study performed by Rahman MZ *et al* showed 10.32 % of malignant cases with metastatic lymph nodes on FNAC [3]. This might be due to the limited sample size in our study. Maximum numbers of malignant cases were in 41 to 50 years of age group which is similar to the results by Khan *et al*. [18]

In the inflammatory category of breast lesions, we observed 1 case of acute mastitis (1.6%) and 2 cases of granulomatous mastitis (3.3%). Both cases of granulomatous mastitis were non-caseating and negative for acid fast bacilli in ZN stain. other cases such as 1 case of galactocele & 7 cases of fibrocystic disease were also found which showed similarity in result with literature [19, 20, 21, 22].

Conclusions

FNAC is a simple, patient –friendly, useful, rapid and reliable diagnostic technique with great practical importance. It forms the most important aspect of cytopathology as a component of triple assessment. It also aids in distinguishing non-neoplastic and neoplastic lesions of breast lump and thereby helps in definitive operative intervention.

Acknowledgments

We wish to thank the Dean of Grant Government Medical College and Sir JJ Group of Hospitals for all the support in carrying out this study.

Conflict of interest: None
Sponsor and financial support: Nil

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