Original Article

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Pathology Section

Cytomorphological Evaluation of Palpable Breast Lump in Third Decade Females

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ABSTRACT

Introduction: Palpable breast lumps are common problem in females, which can be benign or malignant. The most common cancer after cervical cancer is breast cancer. Fine Needle Aspiration Cytology (FNAC) is a simple, rapid, reliable and cost-beneficial procedure to make early diagnosis and planning of treatment modalities.

Aim: To study the spectrum of various breast lesions on cytomorphology in third decade females and correlation of cytomorphological and clinical features.

Materials and Methods: This was a two-year prospective study from January 2018 to January 2020 in Rama Medical College Kanpur, including 200 FNAC samples aspirated from palpable breast lumps. Physical examination of breast lumps was done by palpation. Diagnosis was made based on the cytomorphological criteria and clinical assessment for diagnosis of diseases.

Result: On cytomorphological study of 200 breast lump aspirates in females, 52 (26%) were inflammatory lesions, 123 (61.5%) benign, 13 (6.5%) were atypical/probably benign, 02 (1%) malignant and 10 (5%) were unsatisfactory. The most common benign lesion in the present study was fibroadenoma 60 (48.8%), and the most common malignant lesion was medullary carcinoma 02 (100%) cases.

Conclusion: FNAC is a rapid and reliable tool to provide effective diagnosis in palpable breast lumps. It should be used as routine diagnostic procedure to provide early diagnosis and treatment to the patients with breast lesions.

Keywords: Benign lesion, Fibroadenoma, Fibrocystic diseases, Lactational changes, Medullary carcinoma

INTRODUCTION

Breast cancer are one of the most common cancers in female worldwide. Around 80-85% of tumors are beingn and rest are malignant [1-3]. Breast cancer is a leading cause of morbidity and mortality in women [4]. Benign breast diseases are more prevalent as compared to malignant and inflammatory, as seen throughout the world [5]. Benign breast diseases are more common as compare to malignant, but it is very important to distinguish between benign and malignant lesions before planning final treatment. The "triple assessment" is used for diagnosis of breast lump which includes clinical examination, mammography or ultrasound and FNAC.

The FNAC has become widely accepted as rapid and economical diagnostic tool with high sensitivity and specificity [6]. The sensitivity and specificity of FNAC as a diagnostic tool for palpable breast lumps are 65-99% and 96-100%, respectively [7].

MATERIALS AND METHOD

It was a prospective study carried out in the Rama Medical College Kanpur in a period from January 2018 to January 2020. The Institutional Ethics Committee clearence was taken for the (MEC/Reg.N./ECR/872/Inst/2016). All cases of females who underwent FNAC in the mentioned period were included. A proper written consent in patient's local language was obtained from each patient. Physical examination of breastmass by palpation was done along with the examination of axillary lymph nodes, if any. FNAC was done by using 22/23 gauge needle attached to10/20 cc disposable syringe. Smears were fixed in 95% alcohol and stained with H&E (Haematoxylin & Eosin) and Leishman stain.

Inclusion criteria:

1. Female patient having palpable breast lump of variable size.
2. Age 20-30 years

Exclusion criteria: Patient not giving written informed consent.

Slides were studied under light microscope and cytological diagnosis were made by categorising lesions into insufficient, benign, inflammatory, malignancy, atypical. In this categorisation, insufficient smears were due to hypocellularity, aspiration errors. Benign smears were those showing the characteristic patterns of different benign lesions. No atypical or malignant features were present. Usually duct configurations, myoepithelial cells, and bipolar nuclei were visible. Inflammatory smears show dense inflammatory infiltrate in background along with presence of ductal epithelial cell. While malignancy consists of cellular aspirate with evidently malignant cytologic features. Atypical presents the characteristics of a benign smear and yet there were features that were not usually seen in benign specimens such as, pleomorphism, and discohesive cellular clusters.

RESULTS

Out of 200 breast aspirates of age range from 20-30 years, lump was present in right breast in 80 (40%) cases, in 100 (50 %) cases in left breast, while bilateral in 20 (10%) cases.

The most common site [Table/Fig-1] for lump was upper outer quadrant having 85 (42%) cases followed by upper inner quadrant in 35 (17.5%) cases. In 30 (15%) cases, lump was subareolar and in 15 (7.5%) cases it was diffuse involving all the quadrants. Of the total 200 cases, in 190 cases the aspirated material was adequate to confer the diagnosis, while in 10 (5%) cases it was paucicellular with haemodilution precluding the definite opinion. The spectrum of lesions on cytomorphological interpretation and diagnosis was benign in 123 (61.5 %), inflammatory 52 (26%) cases, atypical 13 (6.5%), and malignant 02 (1%) cases [Table/Fig-2].

In Inflammatory lesions [Table/Fig-3], the maximum cases were of acute mastitis 43 (82.7%) [Table/Fig-4] followed by fat necrosis 05 (9.6 %) having history of previous surgeries and trauma. Two

cases (3.8%) of granulomatous mastitis were present [Table/Fig-5]. In 02 (3.8%) case there was chitinous wall, vegetative nuclei, with scattered lymphocytes, plasma cells, histiocytes, epithelioid cells and foreign body giant cells and diagnosed as cysticercosis.

Quadrant	Number of cases (200)	Percentage (%)
All	15	7.5
Lower inner	15	7.5
Lower outer	20	10
Subareolar	30	15
Upper inner	35	17.5
Upper outer	85	42
Total	200	100

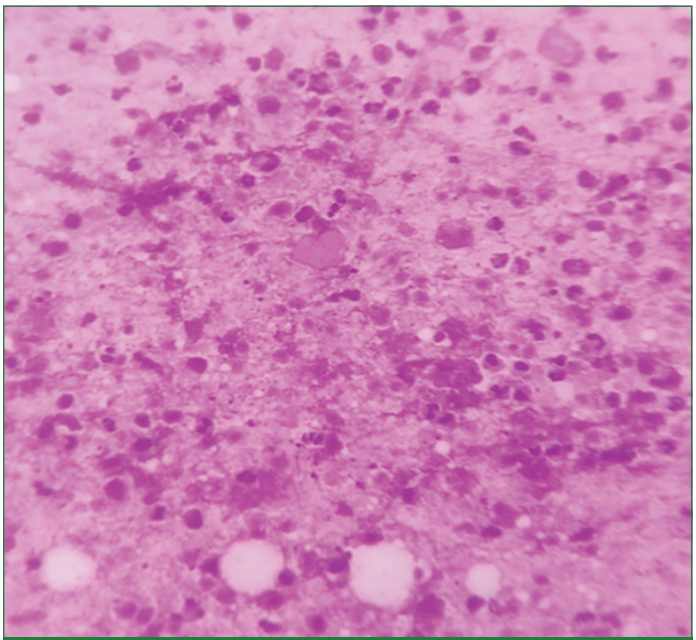
[Table/Fig-1]: Quadrant distribution of Breast lumps.

Cytological diagnosis	Number of cases (200)	Percentage (%)
Inflammatary	52	26
Benign breast lesions	123	61.5
Atypical/probably benign	13	6.5
Malignancy	02	1
Unsatisfactory	10	5
Total	200	100

[Table/Fig-2]: Cytomorphologic spectrum of Breast lumps.

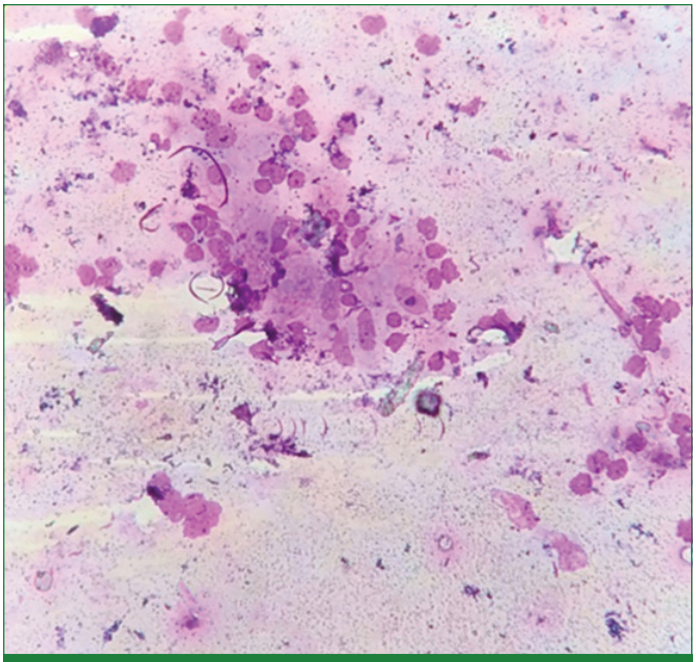
Cytological diagnosis	Number of cases (52)	Percentage (%)
Acute mastitis/abcess	43	82.7
Granulomatous mastitis	02	3.8
Fat necrosis	05	9.6
Cysticercosis	02	3.8
Total	52	100

[Table/Fig-3]: Breast lumps: Distribution of Inflammatory lesions.



[Table/Fig-4]: Acute mastitis-showing acute inflammatory infiltrate along with few ductal epithelial cells (H&E stain X400)

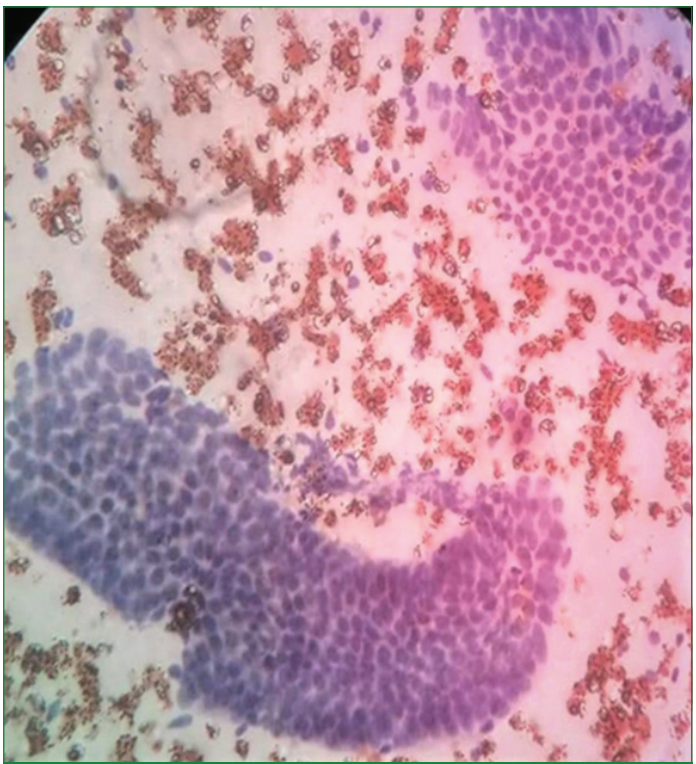
In benign lesions [Table/Fig-6], the maximum cases were of fibroadenoma i.e., 60 (48.8%)[Table/Fig-7]. Out of 123 cases of benign lesions 30 (24.4%) cases were of fibrocystic disease [Table/Fig-8], 20 (16.3%) cases were of galactocele which also decrease in size after aspiration, 07 (5.7%) cases of lactational adenoma [Table/Fig-9], while spindle cell lesion had incidence of 04 (3.2 %) cases and 02 (1.6%) having simple cyst which disappeared after



[Table/Fig-5]: Granulomatous mastitis: showing epitheloid cells forming granuloma with necrotic area along with few benign ductal epithelial cells (H&E stain X400).

Benign breast lesions	Number of cases (123)	Percentage (%)
Fibrocystic disease	30	24.4
Simple cyst	02	1.6
Galactocele	20	16.3
Fibroadenoma	60	48.8
Lactational adenoma	07	5.7
Spindle cell lesion	04	3.2
Total	123	100

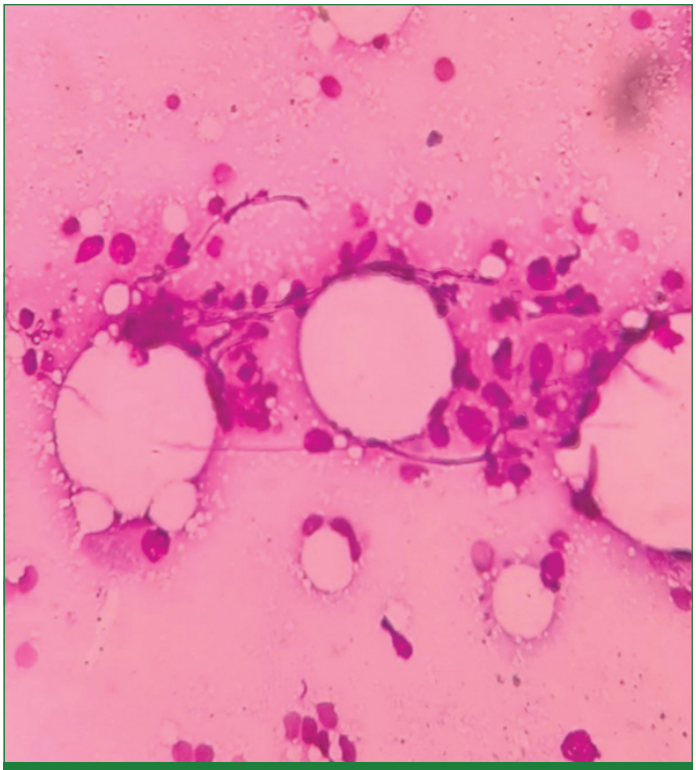
[Table/Fig-6]: Breast lumps: Distribution of benign breast lesions.



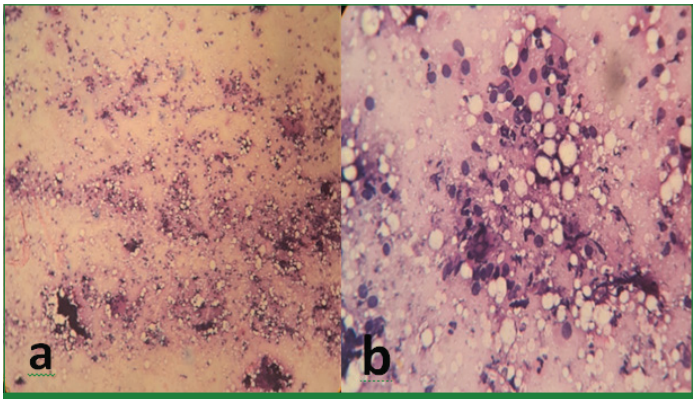
[Table/Fig-7]: Fibroadenoma: showing cohesive sheets of benign ductal epithelial cells along with overlying myoepithelial cells in the haemorrahagic background (H&E stain X400).

aspiration. All cases of malignant lesions were finally diagnosed as medullary carcinoma [Table/Fig-10].

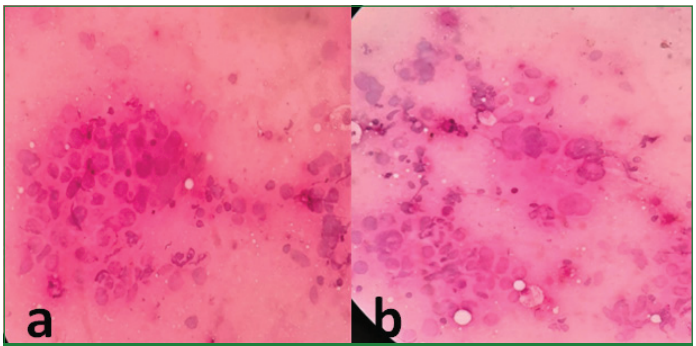
Most of the patients clinically presented with lumps in the breast followed by pain, fever and enlargement of breast [Table/Fig-11].



[Table/Fig-8]: Fibrocystic diseases: scanty cellular showing cluster of benign ductal epithelial cells and foamy cells against a fatty background (H&E stain X400).



[Table/Fig-9]: a) Lactational adenoma: cellular smear showing loose cohesive clusters against foamy background (H&E stain X100); b) showing benign monomorphic epithelial cells having foamy to finely vacuolated cytoplasm in the background of foamy material (H&E stain X400).



[Table/Fig-10]: a) Medullary carcinoma:- highly cellular smear showing loosely cohesive sheets and single cells (H&E stain X100); b) moderately cellular smear showing marked nuclear pleomorphism, nuclear irregularities, along with mononuclear infiltrate (H&E stain X 400).

DISCUSSION

In the present study, 200 breast lump cases were included in which cytomorphological study was done and cytological diagnosis was made. FNAC results were divided into inflammatory, benign, atypical/probably benign, malignant and unsatisfactory categories. Fine needle aspirate was unsatisfactory in 10 cases (5%) for evaluation where no diagnosis was made, rest aspirates were adequate for final diagnosis to be given. Unsatisfactory smears were slightly more than found in the study by Mohammed AZ et al., [8]. It can be due to nature of lesion or technical error. Repeat aspiration with proper technique usually yields adequate material to confer the cytological diagnosis, if still inadequate, core/incisional biopsy remains the choice.

Diagnosis (n=190)	Breast pain	Breast lump	Fever	Enlargement of breast
Fibrocystic disease (30)	20 (66.6%)	25 (83.3%)	-	-
Simple cyst (02)	01 (50%)	02 (100%)	-	-
Galactocele (20)	10 (50%)	20 (100%)	-	-
Fibroadenoma (60)	40 (66.6%)	60 (100%)	02 (3.3%)	06 (10%)
Spindle cell lesion (4)	04 (100%)	04 (100%)	-	01 (50%)
Lactational adenoma (07)	05 (71.4%)	07 (100%)	-	-
Atypical/probably benign (13)	2 (15%)	13 (100%)	-	2 (15%)
Acute mastitis/ abcess (43)	43 (100%)	40 (93%)	35 (81.4%)	-
Granulomatous mastitis (02)	01 (50%)	02 (100%)	02 (100%)	-
Fat necrosis (05)	04 (80%)	02 (40%)	-	-
Cysticercosis (02)	-	02 (100%)	-	-
Medullary carcinoma (02)	01 (50%)	02 (100%)	-	-

[Table/Fig-11]: Represents relation between diagnosis and symptoms of patients of breast disease.

In this study, left side breast lump were more common which is in agreement with Meena SP et al., and Reddy DG and Reddy CRR, [9,10]. Upper and outer quadrants were most commonly involved quadrant (42%). This is in agreement with Rocha PD et al., (45.20%) and Zuk JA et al., (42.2%) [11,12].

In present study, among the benign lesions (123 cases), fibroadenoma was the most common benign lesion 60 (48%) followed by Proliferative breast lesion without atypia inclusive of fibrocystic disease (30 cases; 24.4%), these findings are comparable to study by Ahmad F et al., where fibroadenoma was the most common lesion (41.07%) followed by proliferative breast lesion without atypia (14.29%) and Patel N et al., who reported 43.5% cases of fibroadenoma and 24.1% cases of fibrocystic disease [13,14]. Thus, the present study is in concordance with most of the other studies available.

In the present study, 43 cases of acute mastitis were found which is in contrast with the study of Ahmad F et al., (14 cases) and Patel N et al., (4 cases). The higher number of cases may be due to the age criteria in the present study and cases of acute mastitis may be related to trauma during lactation. Here, in the present study, 5 cases of fat necrosis were found, Ahmad F et al., observed 3 cases of the same [13,14].

Out of 200 cases, 20 cases were of galactocele and 7 cases of lactational adenoma. Galactocele showed benign ductal cell in the background of lipid droplets as vacuoles. Lactation adenoma showed cellular smear with minimal pleomorphism and foamy vacuolated cells. These findings are in concordance with Sharma M et al., who reported 16 cases of galactocele and 5 cases of lactational adenoma in their study of breast lump during pregnancy and lactation [15].

Among 52 cases of inflammatory breast lump, 02 cases (3.8%) showed chitinous wall, vegetative nuclei with scattered histiocytes, though hooklets were not seen and cases were reported as suspicious of cysticercosis after excluding other diagnosis. Cysticercosis of the breast is rare and it should be considered as differential diagnosis for a lump in breast. Ahmad F et al., reported one case of cysticercosis in there study of 280 breast

lumps. Well-formed epitheloid cell granulomas were seen in 02 cases (3.8%) which were reported as granulomatous mastitis [13]. This study is in concordance with the study of Sharma M et al., who reported 3 cases of granulomatous mastitis out of 45 cases [15]. However, Ahmed F et al., reported 12 cases of granulomatous mastitis out of their study of 280 cases, which is higher as compared with the present study [13].

Malignancy was diagnosed in only two cases, both the females were around 30-year-old, smears showed large pleomorphic cells in cohesive clusters with many lymphocytes in the background, lump in both cases were soft fleshy and well circumscribed, it was clinically mimicking benign lesion and FNAC helped in early diagnosis and treatment of these cases.

The FNAC provides early and minimally invasive diagnosis in majority of cases and further reduces the surgical intervention. However, cases with inadequate aspirate and where malignancy cannot be ruled out or confirmed upon is the major pitfall of FNAC

Limitation(s)

Unavailability of resected specimen of all the patients was the limiting factor of the study.

CONCLUSION(S)

The FNAC is a rapid procedure which is minimally invasive, effective method for preoperative diagnosis. It helps to relieve the anxiety of patient and also helpful for postoperative follow-up of breast lumps to ensure the recurrences. In third decade of life benign lesion are common than malignant and fibroadenoma is the most common entity. As 20-30 years are reproductive age group therefore pathologist must be aware of findings of galactocele, lactating adenoma and acute mastitis, which are expected in breast lump during pregnancy and lactation. FNAC is indispensable in the diagnosis of less common malignant tumour like medullary carcinoma, which clinically and radiologically mimic as fibroadenoma.

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