ORIGINAL ARTICLE

Spectrum of Breast Lesions on Fine Needle Aspiration Cytology in Punjab

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ABSTRACT

Background and Objectives: Breast lumps can be diagnosed in a short time by fine needle aspiration cytology (FNAC). Moreover, being cost effective, it is rendered the first choice by surgeons and patients. This study was carried out to outline the spectrum of breast lesions on FNAC in patients presenting with breast lumps in two tertiary care teaching hospitals of Punjab.

Methods: A cross sectional descriptive study was conducted from January, 2018 to October, 2019. Hundred cases of lumps in breast were taken from Sahara Medical College and Sughra Shafi Medical Complex, Narowal and Lahore General Hospital, Lahore. Cytological diagnosis was made and correlated clinically and histologically. Data analysis was done by Statistical Package for the Social Sciences (SPSS) version 24.0 and expressed as frequency and percentages.

Results: Majority (58%) of cases were Class-2 smears on cytology while 11% were malignant and belonged to Class-5. Among the benign lumps, fibroadenoma was the most common (55.1%) followed by fibrocystic disease (17.2%) and acute mastitis (12%). Thirty-one cases were in grey zone i.e. Class-3 smears showing atypia and Class-4 smears that were suspicious of malignancy.

Conclusion: By screening patients with lumps in breast, early and effective management can be made possible. Class 3 and 4 smears should be confirmed with excision and biopsy of the lump for conclusive diagnosis.

KEYWORDS: Fine needle aspiration cytology, Breast lump, Fibroadenoma, Breast carcinoma.

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INTRODUCTION

Breast lumps can be inflammatory, infectious or neoplastic.[1] Clinical examination, mammography and histopathological diagnosis forms the basis for triple assessment of breast lumps. The diagnostic accuracy is close to 100% when all three modalities favor a benign or malignant diagnosis. Fine needle aspiration cytology is easy to perform and is cost- and time-effective method to assess breast lumps.[2,3] This method though considered sensitive and specific for differentiating benign and malignant lesions still bears certain limitations, in particular, for differentiating pure benign or malignant lesions from borderline morphology.[4] Based on the National Health Services Breast Screening Program (NHSBSP) of Britain, there are five categories, from C1-C5, for reporting breast lesions. These are: C1 as inadequate, C2 is benign, C3 is atypical/probably benign, C4 suspicious of malignancy, and C5 is malignant. C3 and 4 are considered as grey zones

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that should be confirmed histopathologically.[5,6]

Inflammatory breast lesions like duct ectasia and fat necrosis show typical anucleated fat cells and foamy histiocytes along with inflammatory cells in smears.[7] Fibroadenoma, the commonest tumour, is a fibroepithelial lesion comprising of epithelial and stromal components.[8,9] It can be differentiated from fibrocystic disease by the presence of stroma, antler-horn clusters, and marked cellularity on cytology.[10] In addition balls and groups of ductal epithelial and myoepithelial cells admixed with macrophages, and apocrine cells are usually seen in fibrocystic disease.[5] Cytology of fibroadenoma and phyllodes can be similar as both have epithelial and stromal components. Phyllodes usually have more stromal fragments with hyperplasia and sometimes atypia. Moreover, stromal fragments are larger and have well defined borders with spindle cells in background as compared to fibroadenoma.[11] Sheets and tight groups of benign ductal epithelial and myoepithelial cells, papillary fronds and foam cells can be seen in intraductal papilloma also but it is usually associated with discharge from nipple and a subareolar mass.[12]

This study was carried out to evaluate the spectrum of breast lesions on FNAC in female and male patients presenting with breast lumps in Sahara Medical College and Sughra Shafi Hospital, Narowal and Lahore General Hospital, Lahore which are two leading tertiary care hospitals of Punjab.

METHODS

The study was conducted at Sahara Medical College Narowal, and Lahore General Hospital Lahore from January, 2018 to October, 2019. Patients of any age and gender presenting for the primary diagnosis of breast lump were included. Patients with bleeding disorders and having recurrence of malignant tumour or already on chemo-radiotherapy and inadequate smears were excluded. Institutional Ethical approval was taken vide Letter Number: SMC/EC/ 01/10/19.

After taking written informed consent, the area of breast with lump was cleaned aseptically. Lump was palpated for examination and aspirate was taken by a 10-cc syringe creating negative pressure. Smears were prepared and fixed in ethanol. Hematoxylin and Eosin staining was performed followed by Giemsa staining. Morphology was assessed on microscope by at least two histopathologists. In case of no consensus, third party review was done and decision was taken on majority opinion.

STATISTICAL ANALYSIS

The data was analyzed using Statistical Package for the social sciences (SPSS) version 24.0 (SPSS for Windows, SPSS Inc., Chicago, IL, USA). Mean with standard deviation was given for quantitative variables while qualitative data was expressed as frequency and percentage. Chi-square test was applied to determine association between categorical variables.

RESULTS

In this study of 100 cases of breast lumps, maximum number of lesions was present in 31-40 years of age group with a mean 34.6 ± 3.672. Only one case was present in 61-70 year of age group (Table-1). There were only two males while rests of the recruited patients were females. Both males were in 31-35 years of age group. Benign breast lesions were seen in patients from age 11 to 45 years with mean age of presentation being 25.06 ±7.977. Most of the benign lesions were present in 20-30 years age group whereas the age range for malignant lesions was 35–60 years with most of the patients presenting between ages 31-40 year. On cytological examination, 58% smears were categorized as Class 2, 11% as Class 3, and 20% as Class 4 or suspicious of malignancy while 11% were classified as Class-5 i-e malignant.

Among the Class 2 smears, fibroadenoma was the most common lesion (55%) followed by fibrocystic disease (17.2%), abscess (12%), sebaceous cyst (5.1%), gynecomastia (3.4%) and traumatic fat necrosis, accessory breast, lipoma and benign phyllodes (1.7%) (Table-2, Fig: 1A).

There were 11% cases of carcinoma of breast (Table-2, Fig: 1B). Thirty-one cases were in grey zone which could not be classified as benign or malignant because the smears had overlapping features of both benign and malignant morphology. Of these 31 cases, 11 were categorized as Class 3 smears (35.4%), where the ductal cells had atypical changes with pleomorphism and prominent

Table-1: Age distribution of breast lesions.

Age (Years) Mean ±SD	Number and Percentage of Patients
11 – 20 (18.41 ± 1.37)	19
21 – 30 (24.65 ± 2.349)	29
31 – 40 (34.6 ± 3.67)	30
41 – 50 (45 ± 2.689)	14
51 – 60 (59.28 ± 1.889)	7
61 – 70	1

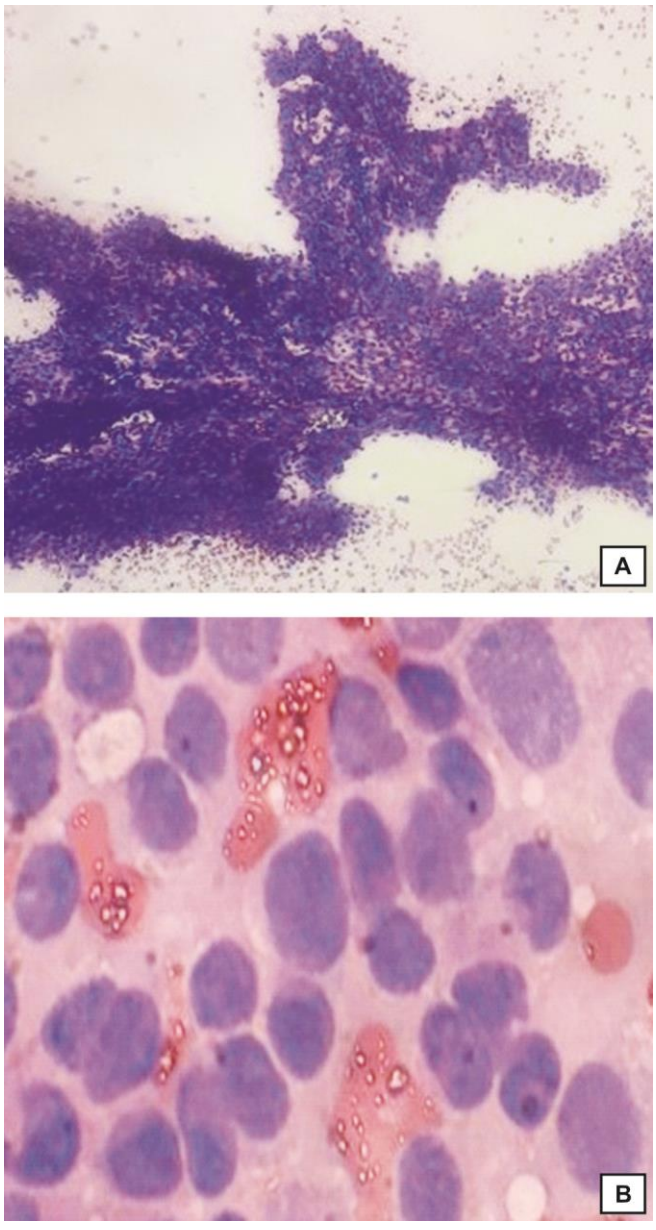

Fig.1: Photomicrograph showing Class-2(A) and Class-5 (B) smears. (H&E Stain, 200X)

nucleoli but with no irregular contours of nuclei or hyperchromasia. Rest of 20 (64.5%) smears were diagnosed as Class 4 or suspicious of malignancy where the nuclear contours were highly irregular and clumps of atypical to pleomorphic cells with dyscohesive aggregates were seen. These smears were not labelled as frankly malignant based on presentation of focal dysplasia rather than diffuse atypia. All grey zone lesions were subjected to excision and biopsy followed by microscopic evaluation.

Table-2: Distribution of breast lesions in male and female patients with breast lump.

S. No.	Lesion	Number of Patients	Percentage
1.	**Class -2**	58	58
	Fibroadenoma	32	55
	Fibrocystic disease	10	17.2
	Abscess/mastitis	07	12.0
	Sebaceous cyst	03	5.1
	Gynecomastia*	02	3.4
	Traumatic fat necrosis	01	1.7
	Accessary breast	01	1.7
	Lipoma	01	1.7
	Benign Phyllodes	01	1.7
2.	**Class- 3**	11	11
3.	**Class -4**	20	20
4.	**Class-5**	11	11

*lumps in males only

Applying chi-square test, no significant association (*P>0.05*) was seen between clinicopathological variables.

DISCUSSION

In this study of hundred cases of breast lesions, most of the patients i-e, 30 (30%) were in 31–40 years age group whereas only 1 (1%) case was in 61–70 years age group (Table-1). Benign breast lesions were from 7 to 45 years of age with peak seen in 20 – 30 years of age group. The results were comparable to the study done by Chandanwale et al.[13] who reported mean age of 31.1 ± 11.12 years for benign lesions. Most of the malignant lesions were reported in 31-40 year of age in the present study which is in contrast to the findings reported by Kaminska et al.[14] where 80% of malignant tumors in breast occurred in females above 50 years of age. Similar reports were published by Nandam et al.[15] who observed patients with malignant breast lesions most frequently were in 41 – 70 years of age. A local study reported the results comparable to present study where

maximum number of females presenting with malignancy were in fourth decade of life, which is quite a younger age group than reported in Western studies.[16] Fibroadenoma is considered as the most common benign breast lesion worldwide followed by fibrocystic changes.[17,18] Abscess was reported in 07 cases and it has been closely linked with breastfeeding women.[19] A quite lower frequency of males (2%) is reported in the present study and both of them presented with cytological diagnosis of gynecomastia. A study from Taiwan reports much higher frequency (42%) of gynecomastia in males.[20] Traumatic fat necrosis and benign phyllodes have been reported in literature in concordance.[2,21]

In the present study there were 11% smears diagnosed as Class-3 and 20% as Class 4. These smears were referred for biopsy evaluation for conclusive diagnosis. In case of Class-3 smears, the cases should be followed up and clinician should be guided to repeat FNAC after 6 months to one year.[5] Malignant smears are mostly invasive ductal carcinoma in females. Only 11% smears were categorized as malignant in present study which is in concordance with a study published by Kamra et al.[22] However, it is in contrast to the findings reported by Arul et al[6] and Madubogwu et al.[23] who found much higher frequency (35%) and (34.6%) in their studies respectively. Similar higher frequencies (36.95% and 22%) are reported in local studies.[25,26]

CONCLUSION

Despite certain limitations, fine needle aspiration cytology is considered as a sensitive and cost-effective method for evaluation of breast lumps. Benign breast lesions are more prevalent in the local population while malignant cases are reportedly less as compared to other reports published from Pakistan. Class-3 and 4 smears should be confirmed with excision and biopsy of the lump for conclusive diagnosis.

LIMITATIONS OF STUDY

Histopathological diagnosis was not carried out as a part of this study. Future large-scale studies may be carried out with comparative histological assessment for reaching a conclusive diagnosis in grey zone cytological lesions.

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CONFLICT OF INTEREST

None to declare.

FINANCIAL DISCLOSURE

None to disclose.

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Author's Contribution

KA: Conception and design, drafting and critical revision for important intellectual content.
BN: Acquisition of data.
TT: Acquisition of data and drafting the article.
AAI: Final approval of version to be published.