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Evaluation of Breast Lesions by Fine Needle Aspiration Cytology at Dhiraj Hospital

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ABSTRACT

Introduction: Fine needle aspiration cytology (FNAC) is very useful technique and routinely done on palpable lesions and it can be used on all organs of the body as a diagnostic procedure.
For preoperative diagnosis of breast lesions, triple approach technique is used and in this FNAC is one of the most important technique[1].
The main purpose of FNAC of breast lesions is in the investigation of any palpable lump and to avoid unnecessary surgery in specific benign conditions. The advantages are- it provides rapid and accurate diagnosis, is therapeutic as well as diagnostic in many cystic conditions.
Materials and methods: The study was Community based cross sectional study and was carried out at pathology department of SBKS MI & RC over a period of 18 months from January 2019.
Results: The C2 category of 60 benign cases consisted of 20 (majority) cases of fibroadenoma, 3 case of phyllodes tumor, 15 cases of benign proliferative breast disease, 1 case of fibrocystic breast disease, 7 cases of inflammatory lesions and 3 case of intraductal papilloma. Out of 5 cases of gynecomastia, 4 cases were benign and 1 case was malignant (intracystic papillary carcinoma) which confirmed by histopathology.
The C5 category of 32 malignant lesions consisted of 31 cases of infiltrating duct carcinoma- NOS type and 1 case of infiltrating duct carcinoma with medullary type.
Conclusion: The study was 100 % sensitive in the diagnosis of malignant lesions.The higher incidence of malignant breast lesions with aged group 41– 60 years of patients.The C2 category of 60 benign cases consisted of 20 (majority) cases of fibroadenoma.The C5 category of 32 malignant lesions consisted of 31 cases of infiltrating duct carcinoma- NOS type.

Keywords: FNAC (Fine Needle Aspiration Cytology), Breast lesions

INTRODUCTION

Fine needle aspiration cytology (FNAC) is very useful technique and routinely done on palpable lesions such as superficial growths of the skin, subcutis, soft tissues and organs such as thyroid, breast, salivary glands, and superficial lymph nodes. It can be used on all organs of the body as a diagnostic procedure.
Breast carcinoma is the most common in women worldwide and it is the most important cause of death related to cancer for women between ages 20 to 59 years.

For preoperative diagnosis of breast lesions, triple approach technique is used and in this FNAC is one of the most important technique[1].

The main purpose of FNAC of breast lesions is in the investigation of any palpable lump and to avoid unnecessary surgery in specific benign conditions.The advantages are- it provides rapid and accurate diagnosis, is therapeutic as well as diagnostic in many cystic conditions.[2]

The limitation of an FNAC is its inability to separate in situ and invasive carcinoma[3].

However, FNAC still happens to be the popular modality of diagnosis because of its overall accuracy in experienced hands, least invasiveness, ability for repeat testing and speed of giving results.

AIM AND OBJECTIVE

- To establish utility and effectiveness in diagnosis of breast lesion byFNAC.
- To study cytological findings of benign and malignant features of breast lesions which co-relate with histopathologicalfindings.
- Find the incidence of breast cancer in palpable lump in different agegroup.
- For utility of FNAC in various breast lesions at different agegroup.
- To study pre-operative confirmation of clinically suspected cancer for guide to further clinicalmanagement.

MATERIALS AND METHOD

Study design: Community based cross sectional study.

Study site: Department of Pathology **,** Dhiraj hospital & Shrimati Bhikhiben Kanjibhai Shah Medical Institute & Research Centre, Piparia, Sumandeep Vidyapeeth

Study population: All the patients having breast lump referred by department of onco surgery, Dhiraj Hospital, either indoor or outpatientbasis.

Sample size calculation: 100 cases were carried out.

Duration: January 2023to July 2024

Inclusion criteria:

- All the patient referred to cytology section of the pathology department, SBKS MI & RC, Piperia
- Clinically having unilateral or bilateral breastlump.
- Male and Female.
- Patient with breast lesion sent for FNAC & also included USG guided /CT guided FNAC for same.

Exclusion criteria:

- Non cooperative patients.

RESULT

The present study includes FNAC material from the 100 cases of breast lesions (110 aspirates) from January 2023 to July 2024 at the Department of Pathology SBKS MI & RC. The observations of the study were asfollows:

AGE AND SEXDISTRIBUTION

The age of the patients ranged from 11 to 80 years. There were 95 female patients and 5 male patients. The age distribution in relation to sex was shown in Table 1.

Table-1 Age and Sex distribution

Age in year	<=20	21-40	41-60	61-80	Total
Males	**1**	2	**1**	1	**5**
Females	**17**	**46**	**23**	**9**	**95**
Total	**18**	**48**	**24**	**10**	**100**

DISTRIBUTION OF BREAST CASES IN RELATIONTO RIGHT OR LEFTBREAST

Out of 100 cases of breast lesions, right side involved in 53 cases, left side involved in 41 cases and 6 cases show bilateral involvement.

CLINICALHISTORY

The most of the patient presenting with mass lesions in the breast. This was observed in all the cases. 17 cases in addition had associated pain, 29 cases presented with anorexia, weight loss, fatigue, 3cases presented with fever, 1 case showed evidence of cracking of nipple underlying to the mass and 1 case show blood mixed nipple discharge.

ADEQUACY OF THESAMPLE

Out of the 100 cases of breast lesion, only 1 case was inadequate for aspiration. Of the 99 adequate aspirates, 58were moderately cellular, and 37 were highly cellular. Only 90 cases underwent a biopsy and could be correlated histopathologically.

NHSBSP REPORTING CRITERIA OF FNAC OF BREAST LESIONS:

According to NHSBSP, the cytology of 100 cases were analyzed and categorized into 5 categories from C1 to C5. There was 1 case in C1 category, 60 cases in C2 category, 4 cases in C3 category, 3case in C4 category and 32 cases in C5 category.

***NHSBSP – National Health Service Of Breast ScreeningProgramme**

BENIGNLESIONS(C2: CATEGORY)

Out of the 60 benign cases, majority of cases (28 cases) from upper outer quadrant.

Table-2: Diagnosis of benign breast lesions (C2) with biopsycorrelation Total 60 cases

No.	Benign lesions	No of cases	Percentage (benign lesions)	No. of biopsy	Histopathology diagnosis confirmed
1	Inflammatory lesions -Breast abscess -Acute mastitis -Granulomatous mastitis	7 (3) (2) (2)	11.66%	07	-Breast abscess (3) -Acute mastitis (2) -Granulomatous mastitis (2)
3	Fibroadenoma	20	33.33%	20	Fibroadenoma (20)
4	Phyllodes tumor	3	5%	03	Phyllodes tumor (3)
5	Benign proliferative breast disease	21	35%	15	Benign proliferative breast disease (15)
6	Fibrocystic breast disease	01	1.66%	01	Fibrocystic breast

					disease(1)
7	Intraductal papilloma	03	1.66%	03	Intraductal papilloma(3)
8	Gynecomastia	05	11.66%	05	Gynecomastia (4)
	Total	**60**		**54**	

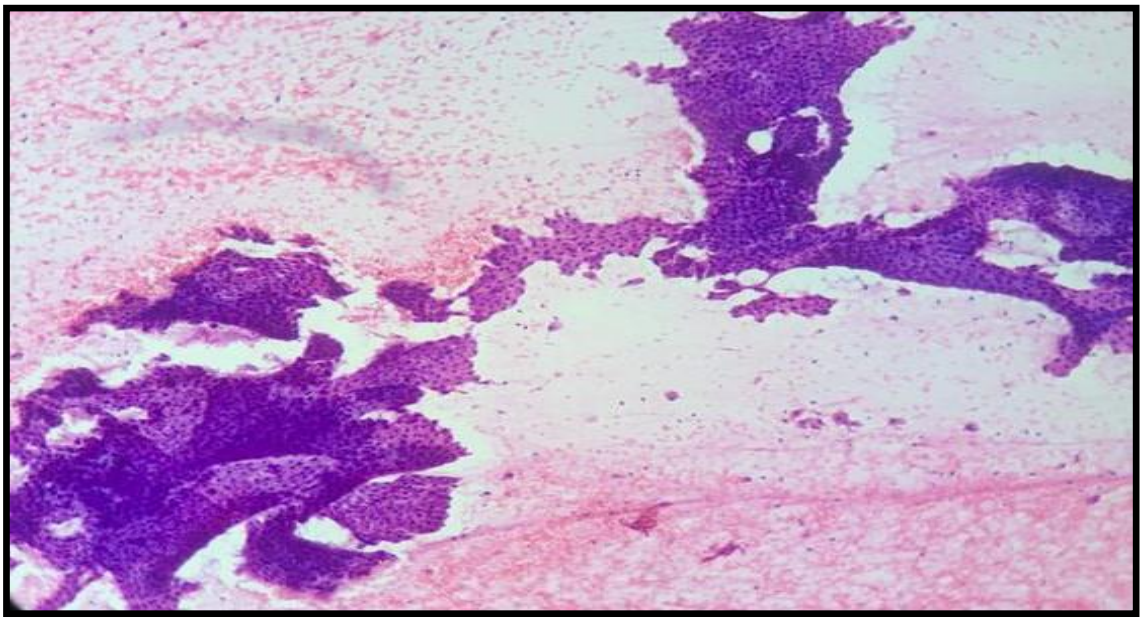


Figure 1:Fibroadenoma (H & E 4x)

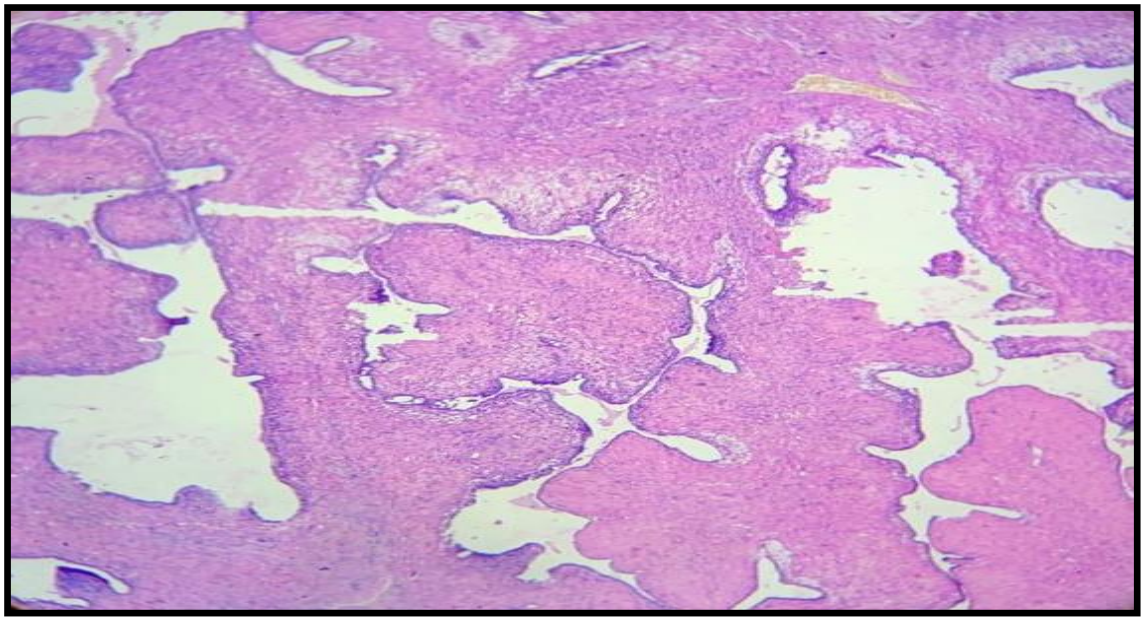


Figure 2:Phyllodes tumor (H&E 4x):The increased stromal cellularity

MALIGNANT LESIONS(C5 CATEGORY)

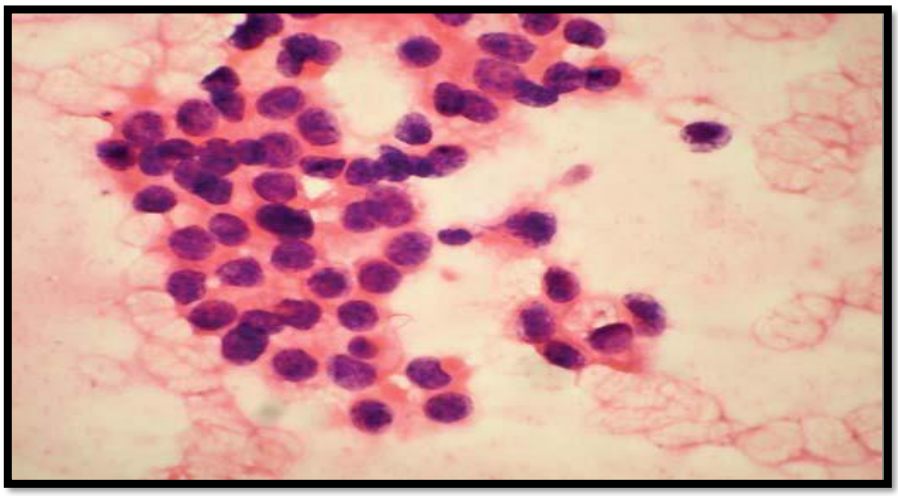
Out of the 32 malignant cases, majority of the cases (25 cases) involved the upper outer quadrant.

Table 3: Diagnosis of Malignant breast lesions(C5) with biopsycorrelation

Sr. No	Malignant lesions diagnosed at cytology	No. of Cases	Percentage (out of30 cases)	No. of biopsied	Histopathology diagnosis
1	Ductal Carcinoma	31	96.87%	31	Infiltrating ductal carcinoma- NOS type
2	Ductal Carcinoma	1	3.13%	1	Infiltrating ductal carcinomawith Medullarytype
	Total	**32**			

INFILTRATING DUCT CARCINOMA-NOS

Out of the 32 malignant lesions, 31 were reported in cytology as ductal carcinoma. The age ranged from 35 to 80 years. The smears were moderately to highly cellular with pleomorphic malignant ductal epithelial cells in loose clusters, sheets, and in singly. Cells showed an enlarged hyperchromatic nuclei, increased N:C ratio, moderate to marked nuclear pleomorphism, coarse to granular to clumped chromatin with prominent nucleoli and cytoplasm was eosinophilic. The patients underwent excision of the mass and the histopathology confirmed infiltrating ductal carcinoma (NOS type) in all 31 cases.



Ductal carcinoma(H & E 40x): Malignant cells with clumped chromatin

DISCUSSION

The age of the patients ranged up to 80 years with the majority in the 21-40 yr age group. Out of 100 cases, majority of the breast masses were located in the right breast in the upper outer quadrant and least in the lower outer &inner quadrant.

Out of 100 cases, in 99 cases the aspirates were adequate and 1was inadequate for interpretation.

Table 4: Comparison Of Various Age Group Incidencesof Benign Breast Lesions With Other

Studies

Age(Years)	Present study	Dr.VenuAnand, et al. 2017 [5]	Neena chauhan et al.2012 [6]
<= 20	17 (28.33%)	23 (16.31%)	**12 (14.63%)**
21-40	33 (55%)	93 (65.95%)	**55 (67.07%)**
41-60	8 (13.33%)	23 (16.31%)	**13 (15.85%)**
61-80	2 (3.33%)	02 (1.41%)	**02 (2.43%)**
Total	**60**	**141**	**82**

Table: 5 Comparison Of Cytological Benign Lesionand Histopathology With Other Studies

Studies	No. of cytological benign lesion (total)	Histopathological diagnosis	
		Benign	Malignant
Tiwari M[9]	16	15 (93.75%)	01 (6.25%)
O'Neil S et al.[10]	166	153 (92.17%)	13(7.83%)
Zhang Qin et al.[11]	215	213 (99.07%)	02 (0.93%)
A.Z. Mohammed et al[12]	61	58 (95.08%)	03 (4.92%)
Present study	**60**	**59 (98.33%)**	**01 (1.67%)**

In present study, 60 cases were diagnosed benign at cytology. Based on this patients were underwent surgery and histopathology showed 59 cases (98.33%) as benign and 1 case (1.67%) asmalignant.
As shown in table all the above mention studies showed comparable results.

Table 6: Comparison Of Cytological Malignant Lesionand Histopathology With Other Studies

Studies	No. of cytological malignant lesion (total)	Histopathological diagnosis	
		Malignant	Benign
Tiwari M[9]	05	05 (100%)	00 (0.00%)
O'Neil S et al.[10]	401	398 (99.25%)	03(0.75%)
Zhang Qin et al.[11]	73	73(100%)	00 (0.00%)
A.Z. Mohammed et al.[12]	27	27 (100%)	00 (0.00%)
Present study	**32**	**32 (100%)**	**00 (0.00%)**

In present study, 32 cases were diagnosed malignant at cytology. Based on this patients were underwent

surgery and histopathology confirmed 32 cases (100%) as malignant. As shown in table all the studies showed comparable results.

CONCLUSION

The present study was undertaken to study the cytomorphology of various breast lesions and to correlate it with histopathology wherever a surgical excision was done and to establish FNAC as an accurate and reliable preoperative diagnostic tool for breast lesions.

The study consisted of 100 cases (110 aspirates) in which 95 female and 5 weremale.

Majority of the patients were between 21-40 year age group. All the patients presented with a mass in the breast.

The following categorizations of FNAC results were observed:

C1-1cases, **C2-60**cases, C3-**4**, cases **C4-3**case, **C5-32**cases

The C2 category of 60 benign cases consisted of 20 (majority) cases of fibroadenoma, 3 case of phyllodes tumor, 15 cases of benign proliferative breast disease, 1 case of fibrocystic breast disease, 7 cases of inflammatory lesions and 3 case of intraductal papilloma. Out of 5 cases of gynecomastia, 4 cases were benign and 1 case was malignant (intracystic papillary carcinoma) which confirmed by histopathology.

The C5 category of 32 malignant lesions consisted of 31 cases of infiltrating duct carcinoma- NOS type and 1 case of infiltrating duct carcinoma with medullary type.

The overall sensitivity in the study was 83.33%, specificity was 100%, positive predictive value in disease was 100% and the false negative percentage was16.66%.

The study was 100 % sensitive in the diagnosis of malignant lesions.

The higher incidence of malignant breast lesions with aged group 41– 60 years of patients.

Thus FNAC is an effective and valid tool as the first line diagnostic modality in the preoperative diagnosis of both benign and malignant lesions.

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