Section: Pathology

Original Research Article

EFFICACY OF FINE NEEDLE ASPIRATION CYTOLOGY ON DIAGNOSIS OF BREAST LUMP. A STUDY IN A TERTIARY HEALTH CARE CENTRE IN GARHWAL REGION.

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ABSTRACT

Background: Breast lump is the most common presentation of the breast disease. Fine needle aspiration cytology (FNAC) is a simple, rapid, and safe, method to diagnose both non-neoplastic and neoplastic breast lesions. **Aim**: To study cyto-morphological pattern of breast lump diagnosed on FNAC in patients of tertiary health care centre and Sub-district hospital and to correlate with its histopathological examination whenever available. **Objectives**: To segregate benign and malignant cases based on cyto-morphological pattern of breast lump on FNAC.
Materials and Methods: A total of 109 patients were included in this study from September 2022 to August 2023. FNAC was performed. Smears were made and stained by Giemsa staining technique and reported. Out of 109 cases 53 cases were sent for histopathological examination.
Results: The age range was 15-70 years. Cytological diagnosis included Unsatisfactory/Inadequate, benign breast disease, atypical/probably benign, suspicious for malignancy, malignant. Fibroadenoma and invasive ductal carcinoma were most common among benign and malignant lesions respectively. Of these 109 cases 53 cases were sent for histopathological examination. A total of 18 case were diagnosed to be fibroadenoma proving it to be most common among benign cause whereas 15 cases were diagnosed to be malignant and the most common was found to be Invasive ductal carcinoma.
Conclusion: FNAC is an easy and quick method to segregate malignant lesions from benign ones which helps in planning further management of a case. Hence, FNAC should be used as a routine diagnostic procedure for its cost effectiveness, rapid and accurate diagnosis.
Keywords: Breast lump, FNAC, Pathology.

INTRODUCTION

Breast lumps are common and accounts for the most common clinical presentation of breast disease.[1] Most of these lumps are benign in nature; not neglecting the fact that carcinoma breast in India is the second most common malignant neoplasm in women, first still being cervical cancer.[2] Breast cancer among women holds one of the leading positions in the profile of cancer incidence in most parts of the world. The incidence of breast cancer in India is about 85 per 100,000 women per year and approximately 50,000 women develop breast cancer in India every year.[3] There is considerable higher mortality and morbidity associated with invasive malignant lesions of breast. If detected in later stage it can have bad prognosis so a prompt evaluation of

all these lumps should be carried out and investigated. The mean survival rate of carcinoma breast is 3 years if left untreated. Overall, benign lesion accounts for 38% cases which is the commonest followed by non-inflammatory and non-neoplastic 36.5%, inflammatory 6% and malignant 20.5%.[4] A palpable breast lump is most common clinical presentation encountered by gynaecologist, surgeons, and physician. Breast lump can be diagnosed by simple day care procedure of Fine needle aspiration cytology.

FNAC is economically cost effective, it helps in rapid diagnosis, has high diagnostic accuracy, multiple samples can be taken from multiple areas of breast, helps preoperative planning of approach to surgery in malignant breast lesions, minimally invasive and safe diagnostic method.[5] Also the need for unnecessary surgical excision of benign breast disease has drastically reduced due to triple assessment test which includes radiological imaging combined with clinical examination and fine needle aspiration cytology.

FNAC provides early diagnosis and hence treatment which helps in reducing the breast cancer related morbidity and mortality. Our study is being done to segregate benign and malignant cases based on cyto-morphological pattern of breast lump on fine needle aspiration cytology and to correlate it with its histopathological examination wherever possible to know the efficacy of FNAC.

Aim: To study cyto-morphological pattern of breast lump diagnosed on FNAC in patients of tertiary health care centre and Sub-district hospital and to correlate with its histopathological examination (HPE) whenever available.

Objectives: To segregate benign and malignant cases based on cyto-morphological pattern of breast lump on FNAC.

MATERIAL AND METHODS

A total of 109 patients were included in this study from September 2022 to August 2023. FNAC was performed. Smears were made and stained by Giemsa staining technique and reported. Out of 109 cases 53 cases were sent for histopathological examination.

RESULTS

Age and Sex distribution

The age range include in this study was between 15-70 years. Most common affected age range was found to be between 31-40 years (Diagram 1).

Laterality of lesion and Anatomical site

Out of 109 cases, in 56 cases lesions were located in right breast, 50 cases had lesion located in left breast and 03 cases had lesion bilaterally (Diagram 2).

Categorisation of breast lump on FNAC

In this study breast lesion were categorised as inadequate (05cases), benign (83 cases), atypical/probably benign (02 cases), suspicious for malignancy (03 cases) and malignant (16 cases) (Diagram 3) & [Table 1].

Out of 109 cases of FNAC only 53 cases were sent for HPE and correlation was done on these cases. Out of 53 cases, all 37 cases which were diagnosed as benign lesion on FNAC were also reported as benign lesion of breast on HPE. A total of 16 cases were diagnosed on FNAC as malignant out of which we received 15 cases for HPE. Histopathological examination of all 15 samples confirmed for different types of breast malignancy. Most common malignant lesion in this study was found to be invasive ductal carcinoma (11 cases) followed by medullary carcinoma (02 cases) and 01 case each of invasive ductal carcinoma with invasive lobular features and poorly differentiated carcinoma. One cases which was diagnosed as suspicious for malignancy on FNA was reported to be atypical ductal hyperplasia on HPE, thus giving a false positive result. [Table 2, Table 3]

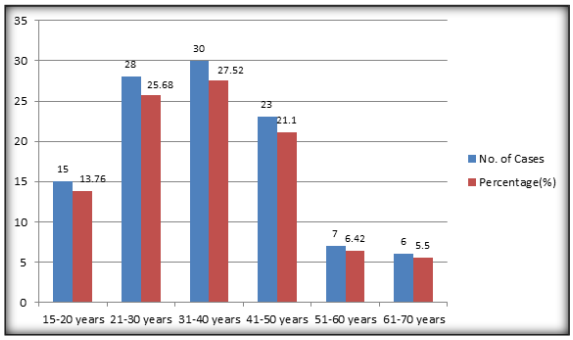

Figure 1: Age Distribution

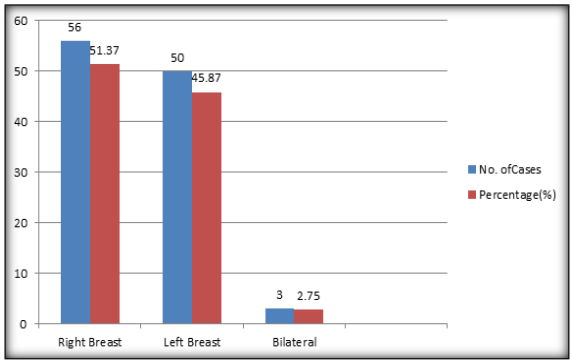

Figure 2: Anatomical site and Laterality

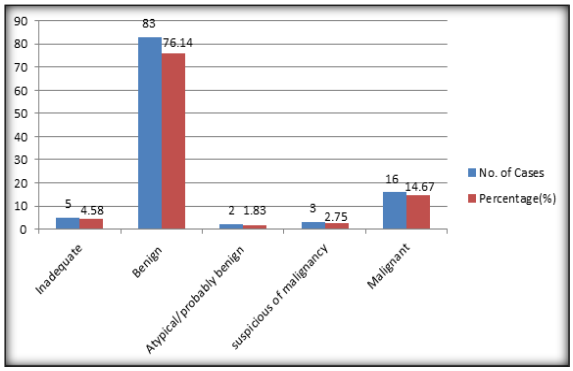

Figure 3: Categorisation of breast Lump on FNAC

Table 1: Distribution of Benign category

Benign category on FNAC.	No. of cases	Percentage
Normal breast tissue	04	3.66
Inflammatory lesions	16	14.67
Breast abscess	09	8.25
Granulomatous mastitis	05	4.58
Fat necrosis	01	0.91
Duct Ectasia	01	0.91
Bening breast lesion	26	23.85
Fibrocystic disease	19	17.43
Gynecomastia	03	2.75
Lactational changes	02	1.83
Epithelial hyperplasia	01	0.91
Galactocele	01	0.91
Fibroepithelial lesions	37	33.94
Fibroadenoma	37	33.94
Total	83	76.14

Table 2: Distribution of malignant cases on HPE

Malignancy type	No. of cases	Percentage
Invasive ductal carcinoma	11	73.33
Medullary carcinoma	02	13.33
Poorly differentiated carcinoma	01	6.66
Invasive ductal carcinoma with Invasive lobular carcinoma	01	6.66

Table 3: Cyto-histological correlation

Cytological diagnosis	Histopathological diagnosis(benign)	Histopathological diagnosis(malignant)	Total
Malignant (16)	01(false positive) b	15(true positive) a	16
Benign (37)	37(true negative) d	00(false negative) c	37
Total (53)	38 (b+d)	15 (a+c)	53

Table 4: Comparison of FNAC findings of present study with various other studies

Studies	Total cases	Benign cases, n (%)	Atypical cases, n (%)	Suspicious cases, n (%)	Malignant cases, n (%)	Unsatisfactory cases, n (%)
Singh et al.[6]	100	51(51)	02(2)	03(3)	39(39)	05(5)
Panjvani et al.[7]	222	150(68.8)	01(0.45)	02(0.90)	69(31.08)	00(0)
Khan et al.[8]	74	24(32.4)	03(4.1)	06(8.1)	41(55.4)	00(0)
Chokshi et al.[9]	407	293(22.59)	08(1.96)	08(1.96)	70(17.19)	28(6.87)
Yusuf et al.[10]	200	109(54.5)	20(10)	27(13.5)	44(22)	00(0)
Present study	109	83(76.14)	02(1.83)	03(2.75)	16(14.67)	05(4.5)

Table 5: Cyto-histopathological correlation of benign lesion of present study with other studies

Study	Total no. of cases	No. of benign lesion (%)	Histopathological diagnosis Benign(%)	Histopathological diagnosis Malignant(%)
Khan et al.[8]	74	24(32.4)	23(95.83)	01(4.17)
Yusuf et al.[10]	200	109(54.5)	99(90.82)	10(9.17)
Panjvani et al.[7]	91	46(50.55)	45(97.83)	01(2.17)
Chokshi et al.[9]	161	88(54.6)	87(98.8)	01(1.13)
Singh P et al.[6]	30	16(53.3)	14(87.5)	02(12.5)
Present study	53	37(69.81)	37(100)	00(00)

Table 6: Comparison of false-positive and false negative rates of different studies

Studies	Total no. of cases	False-positive rate (%)	False negative rate (%)
Yusuf et al.[10]	200	1.2	12
Panjvani et al.[7]	91	00	2.17
Nggada et al.[11]	220	1.9	2.9
Singh P et al.[6]	30	6.77	13.33
Present study	53	1.88	00

Table 7: Comparison of the sensitivity, specificity, and diagnostic accuracy of present study with other studies

Studies	Total cases	Sensitivity (%)	Specificity (%)	Diagnostic accuracy (%)
Hammod et al.[12]	678	94	98	96
Watson et al.[13]	350	77.9	99.5	95
Nicosia et al.[14]	1875	93.2	99.5	95.6
Bhagat R et al.[15]	200	93	98	96
Present study	109	100	97.3	98.1

DISCUSSION

This study included a total of 109 cases of breast lump and out of 109 cases only 53 cases underwent surgery in the form of lumpectomy and mastectomy and specimen were sent for HPE. The age of the patients ranged between 15-70 years with maximum overall cases were in the age group 31-40 years and maximum malignant cases were in the age group 41-50 years. Singh P et al. and Khan et al. also reported 41-50 years6 8 most common age group affected by malignancy, Most of the cases were found to be located in Right breast in our study which was found to be different in other studies as left breast was most commonly affected.

Among 109 cases we found 5 cases (4.5%) to be inadequate for diagnosis due to low cellularity and mostly hemorrhagic areas in the smear. Further rest 104 cases were categorised as benign 83 cases, atypical probably benign 02 cases, suspicious for malignancy 03 cases and malignant16 cases (Diagram 3). A comparative analysis of different study has been shown along with our present study in Table 4.

We received 37 cases (33.94%) of Fibroepithelial lesions all diagnosed on FNAC as fibroadenoma. Only 18 cases were sent for histopathological evaluation. All 18 cases were diagnosed fibroadenoma on HPE. 3 cases showed complex feature like apocrine metaplasia, 2 cases were diagnosed as fibroadenoma with fibrocystic change and 1 case was diagnosed as giant fibroadenoma. Giant fibroadenoma was diagnosed due to its size greater than 10cm and microscopically showed hypercellularity of glands and stroma.

A total of 16 cases out of 109 were diagnosed as inflammatory lesion on FNAC. Most common being breast abscess (09 cases) followed by granulomatous mastitis (05 cases), fat necrosis (01 case) and duct ectasia (01 cases). Out of 16 cases 7 cases were sent for HPE. Among the 7 biopsy specimens 04 were of breast abscess, 01 was granulomatous mastitis and 01 each of duct ectasia and fat necrosis. On HPE all were diagnosed same as on FNAC.

Twenty-six cases were diagnosed as benign breast lesions on FNAC. 12 cases were sent for HPE, among 12 cases 07 were diagnosed as fibrocystic disease of breast, 02 cases reported as gynecomastia, 02 cases were diagnosed as lactational adenoma and 01 case as galactocele. All 12 cases were diagnosed same on FNACas on HPE. Among Benign category the most common lesion encountered was found to be Fibroadenoma (33.94%) which was in accordance with study conducted by Panjvani et al. and Singh P et al. (Table 5).

A study conducted by Chokshi et al. showed 98.8% cyto-hispathological correlation of breast lesions in benign category, whereas in our study it was found to be 100%.

Three cases were diagnosed as Suspicious for malignancy (2.75%) on FNAC. Out of 3 cases we received only 1 case for HPE and reported as atypical ductal hyperplasia on histopathological examination, thus giving a false-positive result (1.88). We received less false positive as compared to other studies (Table 6).

Out of 109 cases we received 16 malignant cases (14.67%). Out of 16 cases 15 underwent surgery in this hospital and mastectomy specimens were sent along with axillary lymph node for histopathological evaluation. All 15 cases were reported malignant with two cases showing axillary lymph node involvement. Among 15 cases, 11 cases were reported as invasive ductal carcinoma on HPE, followed by 2 cases as medullary carcinoma and 1 case each of invasive ductal carcinoma with invasive lobular carcinoma and poorly differentiated carcinoma. Similarly, studies conducted by Panjvani et al, Yusuf et al, Chokshi et al and Singh P et al also found Invasive ductal carcinoma to be the most common malignant lesion on HPE.7,9,10

In our study sensitivity, specificity and diagnostic accuracy was 100%, 97.3% and 98.1% respectively. Hammod et al. Watson et al., Nicosia et al and Bhagat R et al. also found almost similar results in their study (Table 7).

CONCLUSION

FNAC is an easy and quick method to segregate malignant lesions from benign ones which helps in planning further management of a case. Hence, FNAC should be used as a routine diagnostic procedure for its cost effectiveness, rapid and accurate diagnosis. FNAC maximizes the availability of effective health care to patients and it can be relied upon for further management since it has a high sensitivity, specificity, and diagnostic accuracy.

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