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Original Research Article

Spectrum of Female Breast Lesions with Cytological and Histomorphological Correlation in a Tertiary Care Centre of Tripura

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Abstract

Background: Breast lesions are heterogeneous diseases that consist of several distinct entities with remarkably different characteristic features. Majority of the breast lesions initially present with a lump in the breast. Incidence of breast malignancy is increasing in India which can be attributed mostly to changing lifestyle and increased hormone usage, and partly to increasing awareness. Breast cancer is the second most common cancer in Indian women. Breast cancer has bad prognosis if detected in late stages. But, its morbidity and mortality can be reduced if it is detected at earliest stages. A timely and accurate diagnosis of a breast lump is crucial and early intervention reduces the anxiety and can be lifesaving. Fine needle aspiration cytology (FNAC) which is highly sensitive, specific, rapid & easy to perform, is a valuable tool for all breast lesions. It plays an important role in pre-operative assessment of breast lesions. The main purpose of FNAC is to differentiate from benign and malignant lesions and helps in appropriate management. Histopathology plays an important role in the diagnosis of breast lesions. It is the main criteria that assess the adequacy of treatment and is a necessary component in the diagnosis, treatment, and prognosis of breast diseases.

Materials & Methods: The study was conducted in the Department of Pathology of TMC and Dr BRAM Teaching Hospital for a period of 2 years. A total of 192 female patients with palpable breast lump were included in the study. All cases presented with breast lump were evaluated with FNAC. Cytological and histomorphological correlation was done and diagnostic accuracy of FNAC was determined. Suppurative lesions with purulent material were sent to microbiology department for culture sensitivity testing and Ziehl-Neelsen staining to rule out Acid Fast Bacilli.

Results: A total of 192 patients with palpable breast lumps were included in the study. Among them majority of the patients were in the age group of 21–30 years of age, followed by 31–40 years. Majority of the lesions were in benign category. Fibroadenoma was the most common benign breast lesion and Invasive Ductal carcinoma was found to be the most common malignant breast lesion.

Conclusion: Fine-needle aspiration cytology (FNAC) is a rapid and effective diagnostic tool for workup of various breast lesions. It also helps in differentiation and categorization of palpable breast lumps into benign and malignant lesions. Benign breast lesions are common than malignant lesions.

Keywords: Breast lesions, FNAC, Histopathology.

Introduction

The breast is a modified sweat gland composed of both epithelial and connective tissue elements. It is a glandular organ influenced by hormones in females and composed of various structures giving rise to different types of lesions and lumps.[1,2] Diseases of breast, with their uncertain causes and confusion of treatments, have intrigued physicians and medical historians throughout the ages.[5] A breast lesion whether benign or malignant, is a cause of anxiety to the patients.[6] Advances in imaging techniques and increased use of FNAC have greatly assisted the preoperative evaluation of breast lesions. However, in a large proportion of cases differentiation between benign and malignant breast lesions still rests on histopathological examination.[7] Most of the breast lesions are well understood and well diagnosed while some of the unusual lesions and malignancies are less appreciated.[1] Benign as well as malignant breast lesions are quite common in Indian population. Currently in India, the incidence of breast cancer is low but it is rising slowly among urban as well as rural females.[8] Breast cancer has bad prognosis if detected in late stages, however morbidity and mortality of breast cancer can be reduced if it is detected at earliest stages. Histopathology plays an important role in the diagnosis, treatment, and prognosis of breast diseases. This present study was undertaken to assess the spectrum of female breast lesions in a tertiary care centre of Tripura and also to evaluate the diagnostic reliability of FNAC by comparing the cytological findings with the histopathological diagnosis.

Materials and Methods

A hospital based prospective study was undertaken in the Department of Pathology of TMC and Dr BRAM Teaching Hospital, a tertiary care centre of Tripura from March 2021 to February 2023. A total of 192 female patients presenting with palpable breast lump were included in the study. After taking informed written consent from the patient, history was taken and general physical examination was done. Under all aseptic precautions, FNAC was performed with standard technique using 23 gauze needle and 20cc disposable syringe. Smears were prepared and stained with Giemsa and Papanicolau Stain. Suppurative lesions with purulent material were sent to microbiology department for culture sensitivity testing and Ziehl-Neelsen staining to rule out Acid Fast Bacilli. Out of 192 cases, histopathological analysis was performed on 38 patients who underwent lumpectomy or mastectomy. Statistical analysis was done. Cytological and histopathological correlation was performed. Sensitivity, specificity, positive predictive value and negative predictive value of FNAC for benign and malignant lesions were done. Diagnostic accuracy of FNAC as compared to biopsy were calculated using the standard formulas. The results obtained were tabulated based on the statistical test analysis.

Results

A total of 192 female patients with palpable breast lump were included in the study. Among them majority of the patients were in the age group of 21–30 years (41.14%), followed by 31–40 years (23.95%) and 41-50 years (11.45%) which is depicted in table number 1 and figure number 1.

Table 1: Distribution of patients presenting with palpable breast lump according to age group

Age group	No of cases	Percentage (%)
11-20	29	15.10
21-30	79	41.14
31-40	46	23.95
41-50	22	11.45
51-60	15	7.81
>60	1	0.52

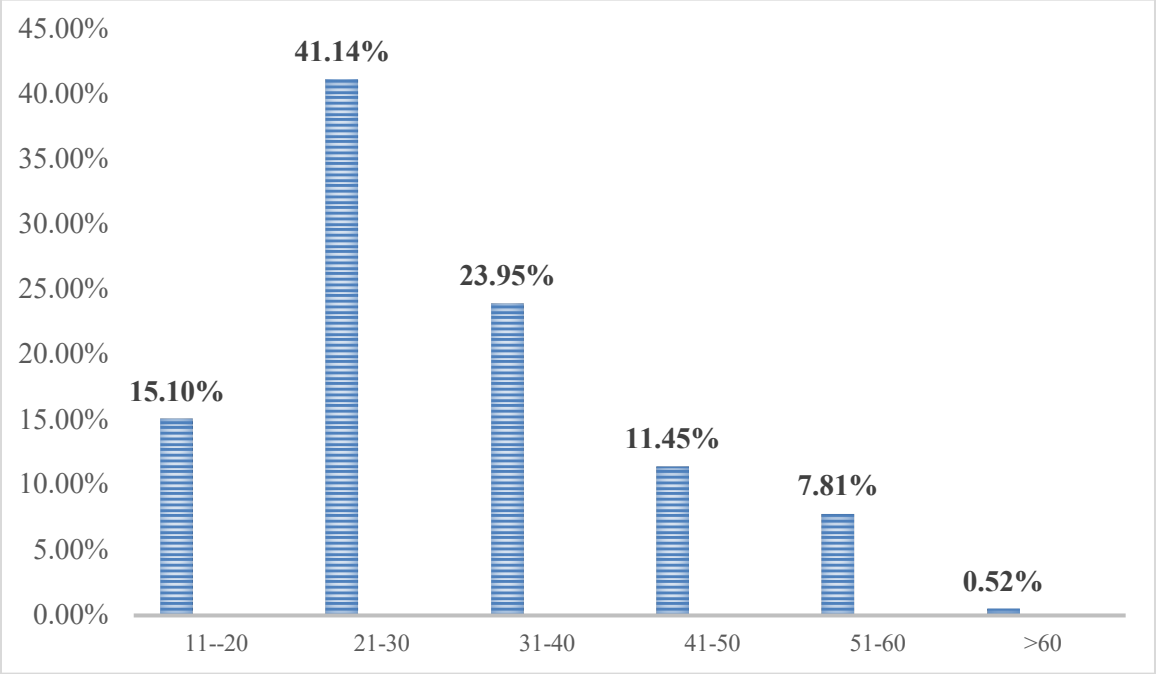


Figure 1: Distribution of patients presenting with palpable breast lump according to age group:

All patients presenting with palpable breast lump underwent FNAC. Out of 192 cases, 118 cases (61.45%) were in the benign category, 20 (10.41%) were in the malignant category, 6 (3.12%) were in the suspicious of malignancy category, and 48 (25%) belonged to the suppurative and inflammatory category, which is depicted in table number 2 and figure number 2.

Out of 118 benign cases, Fibroadenoma was the most common benign breast lesion which accounted for 87 cases (45.3%). Out of 20 malignant cases, Ductal carcinoma was found to be the most common malignant breast lesion. Among the suppurative and inflammatory category, Acute mastitis or abscess was found to be the most common lesion (20.31%).

Table 2: Distribution of breast lesion according to cytological diagnosis

Category	Diagnosis	No of cases	Percentage (%)
Benign	Benign proliferative breast lesion without atypia	17	8.85
	Benign proliferative breast lesion with atypia	8	4.16
	Fibroadenoma	87	45.3
	Galactocoele	2	1.04
	Lactating adenoma	1	0.52
	Lipoma	1	0.52
	Benign phylloides	2	1.04
Suspicious of malignancy		6	3.12
Malignant	Ductal Carcinoma	19	9.89
	Lymphoma	1	0.52
Suppurative and inflammatory	Acute mastitis	39	20.31
	Fat necrosis	5	2.60
	Chronic nonspecific mastitis	3	1.56
	Duct ectasia	1	0.52

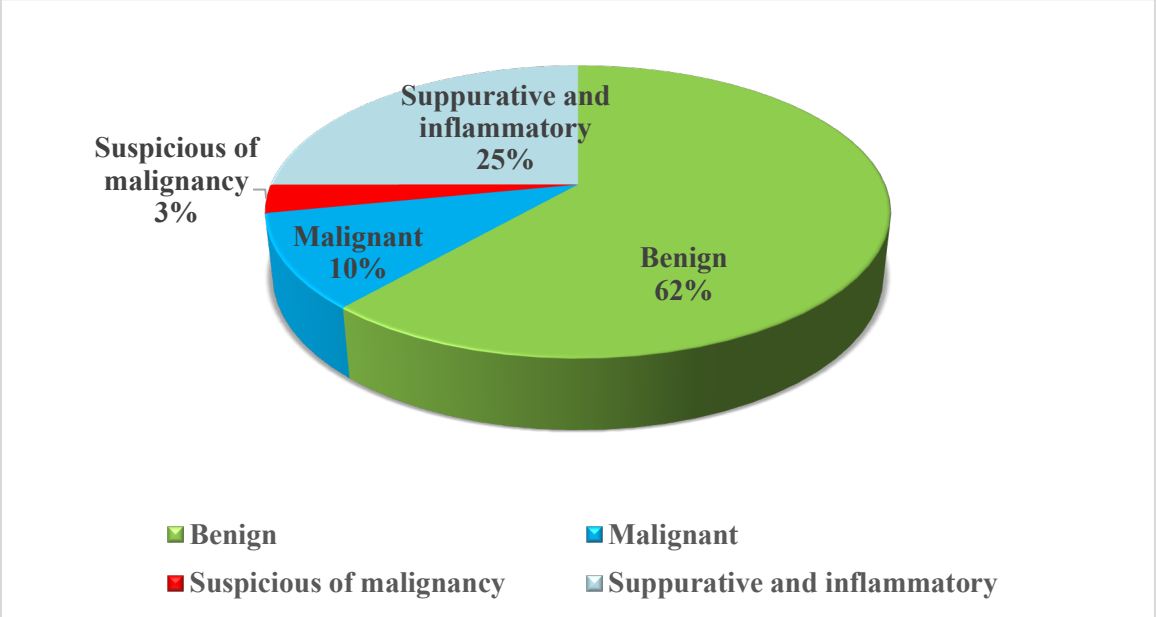


Figure 2: Distribution of breast lesion according to cytological diagnosis.

Among 192 cases, histopathological analysis was performed on 38 cases only who underwent lumpectomy or mastectomy. Among 38 cases, 30 were found to be in benign category and 8 cases were found to be in malignant category. Among the 30 benign cases which were diagnosed cytologically included 25 cases of Fibroadenoma, 3 cases of benign proliferative breast disease without atypia, 1 case of benign proliferative breast disease with atypia and 1 case of benign phyllodes.

Out of 30 benign cases which were diagnosed cytologically, all cases were diagnosed to be in benign category histologically, with few cases which turned out to be of different lesions.

Among the 25 cases of Fibroadenoma which were diagnosed cytologically earlier, Histopathological analysis confirmed 22 cases of Fibroadenoma, 1 case each of Lactating adenoma, Nodular adenosis and Fat necrosis with adenosis. Out of 3 benign proliferative breast lesion without atypia on cytology, 2 cases turned out to be Fibroadenoma with cystic change and 1 case turned out to be Usual Ductal Hyperplasia on Histopathology. 1 case of benign proliferative breast lesion with atypia on cytology turned out to be Fibroadenoma on Histopathology and 1 case of Phyllodes turned out to be Benign Phylloides on Histology.

Among the 8 malignant cases which were diagnosed cytologically earlier, 7 cases turned out to be of Invasive ductal carcinoma and 1 case of mixed ductal and lobular carcinoma type on histopathology later.

Table 3: Correlation of cytological and histopathological study of breast lesions

Cytological diagnosis	No of cases		Histopathological diagnosis
Fibroadenoma	25	22	Fibroadenoma
		1	Lactating adenoma
		1	Nodular adenosis
		1	Fat necrosis with adenosis
Benign proliferative breast lesion without atypia	3	2	Fibroadenoma with cystic change
		1	Usual Ductal Hyperplasia
Benign proliferative breast lesion with atypia	1	1	Fibroadenoma
Phylloides	1	1	Benign Phylloides
Ductal Carcinoma	8	7	Invasive Ductal Carcinoma
		1	Mixed ductal and lobular carcinoma type

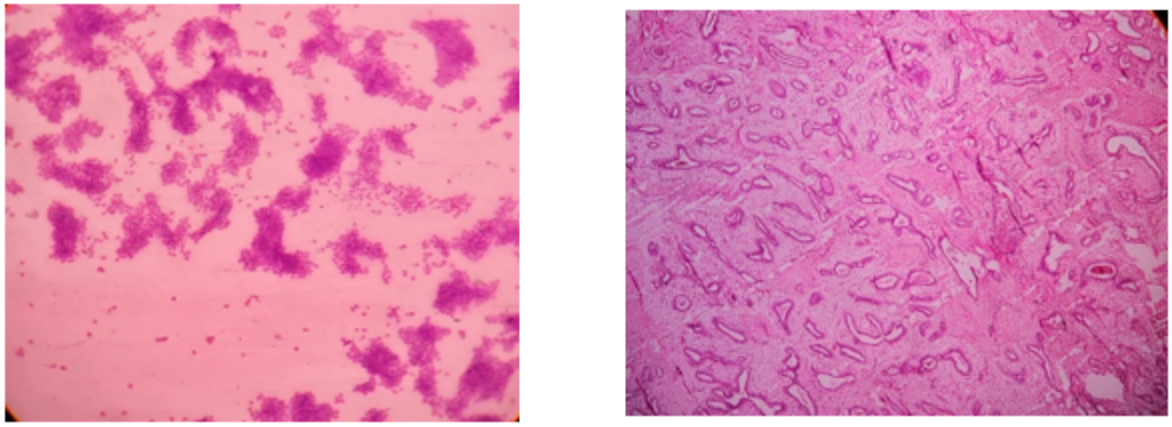
In histological correlation of 38 cases, cytologically 30 benign and 8 malignant cases were histologically confirmed as benign and malignant cases.

In this study, to differentiate benign from malignant lesion, sensitivity, specificity, positive predictive value, negative predictive value and accuracy of 100% each was reported which is depicted in table number 4.

Table 4: Diagnostic Accuracy of FNAC as compared to Histopathology

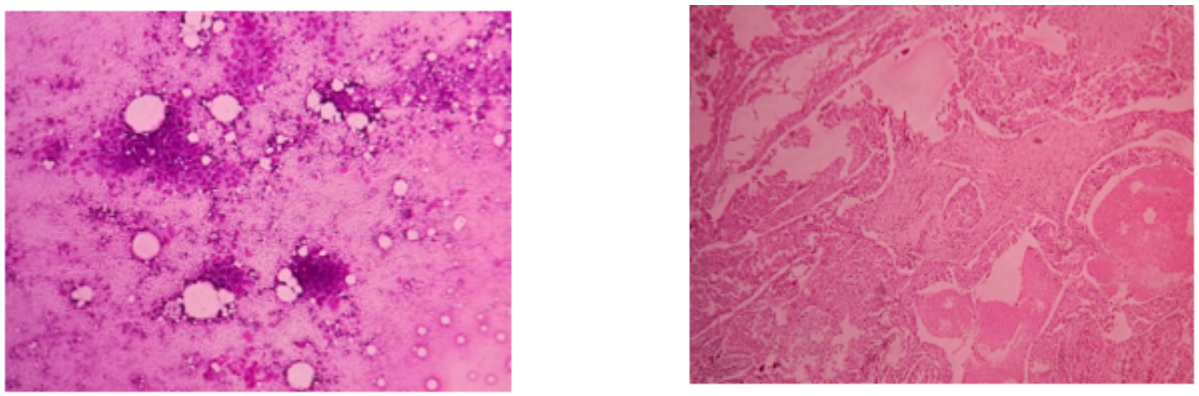
Cytological diagnosis		Histopathological diagnosis		Total
		Benign	Malignant	
Benign	30	30 (a)	0 (b)	30(a+b)
Malignant	8	0(c)	8 (d)	8(c+d)
Total 38		30(a+c)	8 (b+d)	38 (a+b+c+d)

a: true positive; b: false positive; c: false negative; d: true negative.



(A) (B)

Figure 1: (A) Fibroadenoma: Staghorn Pattern Of Ductal Epithelial Cells , FNAC, Giemsa Stained (10X)
(B) Fibroadenoma : Pericanalicular And Intracanalicular Pattern, H&E Stained (10X)



(A) (B)

Figure 2: (A)Ductal Carcinoma, FNAC, Giemsa Stained (10x)
(B)Invasive Ductal Carcinoma, H&E (10x)

Discussion

Human breast is composed of specialized epithelium and stroma that may give rise to both benign and malignant breast lesions.[9] Histopathological spectrum of breast lesion and their etiology varies among different countries and ethnic group.[10] Benign breast lesions are more common than malignant breast lesions. The present study was conducted to assess the spectrum of breast lesions in a tertiary care centre of Tripura and also to assess its cytological and histological correlation. In this study, maximum incidence of breast lumps was reported in the 21-30 years of age group followed by 31-40 years of age group which was similar to a study conducted by Nagpal R *et al*.[11] In the present study, benign breast lesions accounted for 61.45% cytologically, which is similar to a study conducted by Sharif A *et al*.[12] Malignant breast lesion accounted for 10.41% cases cytologically in this study whereas Agarwal R *et al* conducted a study and reported 17.27% cases of malignant breast lesion.[13] This is contrary to a study conducted by Sharif A *et al* in 2020.[12] In this study, most common benign breast lesion in FNAC was found to be Fibroadenoma (45.3%) which

was similar to a study conducted in Uttar Pradesh in 2017 by Agarwal R and colleagues (45.4%).[13] In this study, to differentiate benign from malignant lesion, sensitivity, specificity, positive predictive value, negative predictive value and accuracy of 100% each was reported which is similar to a study conducted by Das KK *et al* in 2019.[14]

Conclusion

FNAC is simple, minimally invasive, rapid and cost effective method of diagnosis. It has few manageable complications and can be done on outpatient basis. It is thus helpful in preoperative evaluation and to differentiate from benign and malignant lesions which helps in appropriate management and can avoid unnecessary surgical intervention. It also significantly reduce patient's waiting time. This study supports that cytological examination using FNAC which is an economical, rapid, easy and valuable diagnostic tool.

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