

## A study of histopathological spectrum of breast lesions

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### Abstract

**Introduction:** Breast lesions is a common problem. Incidence of benign breast lesions begins during second decade of life, peaks in fourth and fifth decade. Increased risk of breast cancer is associated with proliferative and atypical hyperplasia. Diagnostic modalities like mammography, ultrasonography, FNAC, Tru-cut biopsy are used. According to Indian Council of Medical Research Statistics, 10,000 breast cancers are being diagnosed every year in India, with more than 70% diagnosed at advanced stages. Hence, the histopathological spectrum of the breast's neoplastic and non-neoplastic lesions was planned for better evaluation. **Aim:** This study evaluates the frequency, age, gender, and histopathological profile of non-neoplastic and neoplastic breast lesions. **Material and Methods:** This study includes patients with breast disease admitted to the surgery department, MBS Hospital - Kota, Rajasthan from January 1, 2017, to December 31, 2019. The histopathological diagnosis is based on pre-operative fine needle aspiration cytology and histopathology of a post-operative specimen. **Results:** A total of 602 patients with breast lesions were admitted, including 588 females (97.67%) and 14 male patients (2.32%). Peak age of lesions was 15 years to 25 years (36%) including neoplastic and non-neoplastic lesions. Among 439 benign lesions, 216 lesions were fibroadenoma (49.20%), 85 were Breast abscess (19.36%), 13 were fibroadenosis (2.96%), 2 cases of duct papilloma (0.45%), 2 cases of benign phylloid (0.45%). Among 163 patients (27.08%) of neoplastic lesion, 141 were invasive duct carcinoma (86.50%). **Conclusion:** The pattern of breast lesions was obtained with valuable information concerning clinico-pathological profile of breast lesions.

**Keywords:** Breast carcinoma, fibroadenoma, neoplastic and non-neoplastic breast lesion, invasive duct carcinoma.

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### Introduction

Breast lesions are a heterogeneous disease that consists of several distinct entities with remarkably different characteristic features, most of the breast lesions are well understood and well diagnosed, while some of the unusual lesions and malignancies are less appreciated. The majority of breast lesions initially present with a lump in the breast, which is very sensitive for female patients. They might not report timely to the doctor for an examination[1].

A timely and accurate breast lump diagnosis is crucial, and early intervention alleviates anxiety and can be lifesaving. In recent years, breast lesion has gained increased importance and global attention due to the increased mortality and morbidity associated with breast cancer. Also, Awareness among women regarding breast lump has grown[1]. Many studies on the spectrum of breast lesions have been conducted. The spectrum varies among various countries and ethnic groups. Concerning finding of the breast includes a hard mass that is fixed and irregular in shape and firmly adherent to the surrounding tissues. The cause of breast masses is fibroadenoma, fibroadenosis, acute or chronic inflammatory breast lesion, galactocele, breast malignancy—malignant breast lesion account for around 22% of breast lesions[2].

In India, the incidence of breast cancer is significantly lower than in western countries. Breast cancer in India varies from as low as 5 per 100,000 female population per year in rural areas to 30 per 100,000 female population per year in urban areas. There is an impression of a higher incidence of breast cancer in younger women in India. Most hospital-based series report median age of breast cancer patients a decade younger than western series.

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The incidence of breast cancer increases with age, which is true in India as in the rest of the world. Breast cancer screening using various approaches has been the subject of several large randomized trials in the USA, Canada, and Europe. Population-based mammographic screening of asymptomatic postmenopausal women has shown a modest reduction in breast cancer death in high incidence affluent western countries and associated over-diagnosis and over-treatment[3].

However, a population-wise mammographic screening program for asymptomatic women is not feasible in India. It may not be useful due to lower breast cancer incidence and population structure in India[4]. Periodic physical examination of the breast by trained health workers and health education is compared with only health education in an ongoing NIH-sponsored randomized trial in Mumbai[5].

Breast self-examination (BSE) by women may help in identifying breast tumors earlier. Still, there was no reduction in breast cancer mortality in one randomized screening trial of BSE versus no intervention[6].

Histopathology plays a vital 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 disease[7]. The primary purpose of this study is to find out the breast disease profile and to know a load of breast cancer in our hadoti region.

### Material and Method

This study was conducted in the Department of Surgery, MBS Hospital, Kota, Rajasthan, India, from January 01, 2017, to December 31, 2019.

### Inclusion criteria

All mastectomy and excision biopsy specimens recovered after surgery were sent for histopathological examination. Among the 602

specimens, most of them were lumpectomy specimens, and a few of them were mastectomy specimens. The history and clinical presentation, fine-needle aspiration cytology (FNAC), mammography, sono-mammography, ultrasonography of abdomen and pelvis, chest x-ray findings, and other relevant information were obtained from the history and clinical examination of the patient. The clinical details were recorded as per findings, and related special investigations were taken into consideration. Fine-needle aspiration was done using the non- aspiration technique except for cystic lesions; the procedure was repeated in the case of non-diagnostic aspirates.

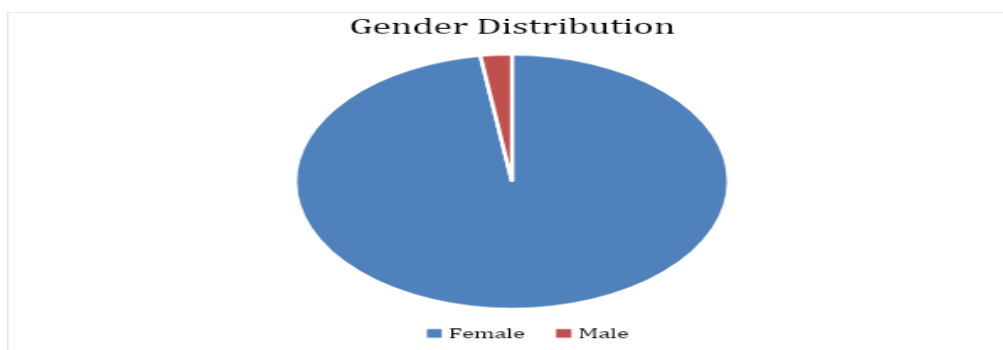
**Results**

Out of the 602 patients investigated, the gender distribution is, 588 patients were female (97.67%), and 14 were male patients (2.33%) [Table 1]. The peak age of the occurrence of breast mass was in the 15 to 25 years of age (36% occurrence) followed by the 26 years to 35 years of age (24.41% occurrence) [Table 2]. About 218 patients were younger than 25 years of age, 147 (24.41%) patients aged between 26 years to 35 years, 106 (17.60) patients between aged 36 years to 45 years, 63 (10.46%) patients aged between 46 years to 55 years, 49 (8.13%) patients aged between 56 years to 65 years, 17 (2.82%) patients aged between 66 years to 75 years and 2 (0.33%) patients aged more than 75 years. The marital status of our study had 506 married cases (84.61%), whereas 96 (15.94%) patients were unmarried [Table 3]. Racial distribution in our study consist of 403 Hindu females (66.94%), 120 Muslim females (19.93%), 14 Hindu males (2.32%), 3 Sikh females (0.49%), 2 Christian females (0.33%) [Table 4]. The incidence of breast lesions was almost equal, with 291 cases having occurrence on the right side (48.34%) and 291 cases on the left side (48.34%), along with 20 cases having bilateral occurrence (3.32%) [Table 5]. Region-wise distribution of breast lesion, in our study, 307 (50.99%) cases belongs to rural areas, and 295 (49.00) cases belong to the urban region [Table 6]. Quadrantic distribution of disease, in our study-upper outer quadrant, was as affected in 254 patients (42.19%), central quadrant involved in 92 patients (15.82%),

lower outer quadrant diagnosed in 76 patients (12.62%), the upper inner quadrant was reported in 71 patients (11.79%), lower inner quadrant involved 23 patients (3.82%), the whole breast had 17 patients (2.82%), remaining quadrants UI/UO, LI/LO, UO/UI/LO involved around 1.10% of patients [Table 7]. In our study, the non-neoplastic lesion was 439 (72.92%) patients, and neoplastic lesions were of 163 patients (27.08%) [Table 8]. Incidence of the neoplastic lesion in our study, invasive duct carcinoma was reported in 141 cases (86.50%). Five patients had distant metastasis, and three patient lungs mets, two patients hepatic mets, threes patients were of mixed nature (invasive ductular and invasive lobular), two patients had adenocarcinoma, recurrent invasive duct carcinoma in 3 patients, locally advanced breast carcinoma in 2 patients, two patients were of one side breast carcinoma and another side benign breast disease, two patients were having malignant phylloid of low grade, one patient had breast carcinoma, Paget' disease, one patient had breast carcinoma with dystrophic calcification and one patient was of male breast carcinoma which contributes around 0.56% of malignant lesion of the breast [Table 9]. Pattern of benign breast disease, fibroadenoma found to be most common benign breast lesion in 216 patients (49.20%), breast abscess in 85 patients (19.36%), mastitis in 22 patients (5.01%), benign proliferative disease of breast in 15 patients (3.41%), atypical epithelial hyperplasia was diagnosed in 15 patients (3.41%), gynaecomastia in 13 patients (2.96%), mastalgia discovered in 8 patients (2.27%), fibroadenosis in 8 patients (1.82%), fibroadenoma with fibroadenosis in 8 patients (1.82%), antiobioma in 8 cases (1.82%), lipoma in 6 cases (01.36), fibrocystic disease of breast in 5 cases (1.13%), accessory breast in 4 cases (0.94%), fat necrosis in 3 patients (0.68%), pleomorphism with necrosis in 3 cases (0.68%), cold abscess in 2 patients (0.45%), duct papilloma in 2 patients (0.45%), duct ectasia in 2 patients (0.45%), phylloid tumour in 2 patients (0.45%), sebaceous cyst in 2 cases (0.45%), recurrent sinus in 2 cases (0.45%), nipple discharge in 2 cases (0.45%), and 1 case each of sclerosing adenosis, tubular adenoma, and apocrine hyperplasia [Table 10].

**Table 1: Gender Distribution**

S. No.	Gender	No. of Cases	% of Cases
1	Female	578	97.67
2	Male	14	2.33



**Figure 1: Gender Distribution**

**Table 2: Age Incidence of breast disease**

Age Group (in years)	No. of Cases	% of cases
<25	218	36.21
26-35	147	24.42
36-45	106	17.61
46-55	63	10.47
56-65	49	8.14
66-75	17	2.82
>75	2	0.33

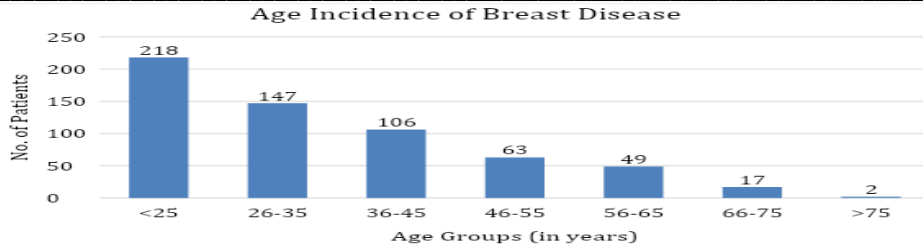


Figure 2: Age incidence of breast diseases

Table 3: Marital Status of Breast Disease

Marital status	No. of cases	% of cases
Married	506	84.05
Unmarried	96	15.95

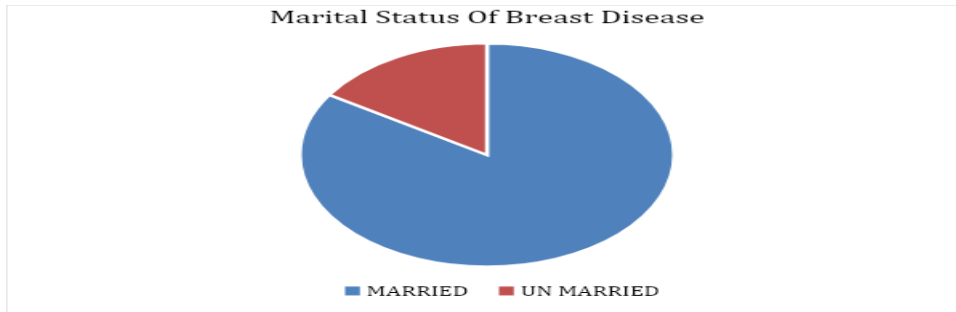


Figure 3: Marital Status of Breast Disease

Table 4: Racial Distribution of Breast Disease

S. No.	Gender	No. of Cases	% of Cases
1	Hindu Female	403	66.94
2	Muslim Female	120	19.93
3	Hindu Male	14	2.32
4	Sikh Female	3	0.49
5	Christian Female	2	0.33

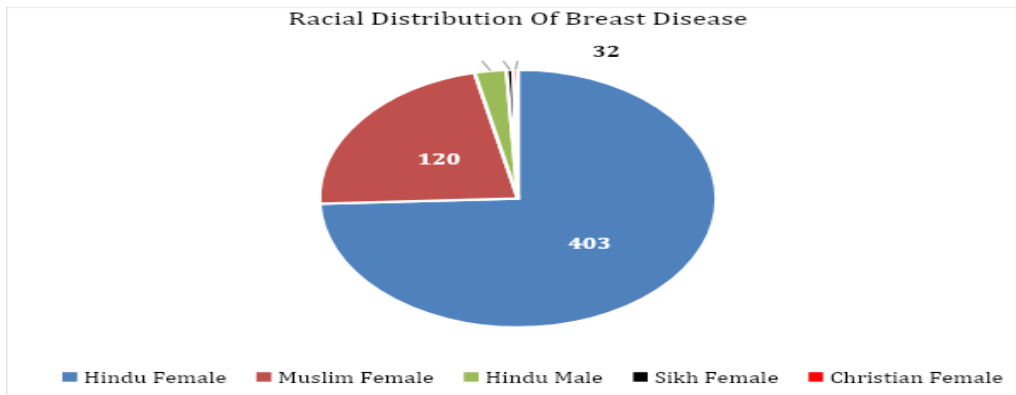


Figure 4: Racial distribution of breast disease

Table 5: Side Wise distribution Of Breast Lesion

Side	No. of Cases	% of Cases
Right	291	48.34
Left	291	48.34
Bilateral	20	3.32

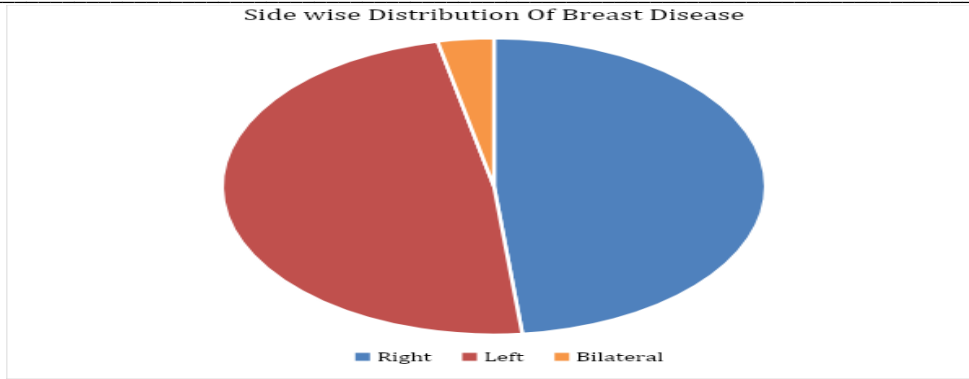


Figure 5: Side Wise distribution Of Breast Lesion

Table 6: Region-Based Distribution

S. No.	Region	No. of cases	% of cases
1	Rural	307	50.9966777
2	Urban	295	49.0033223

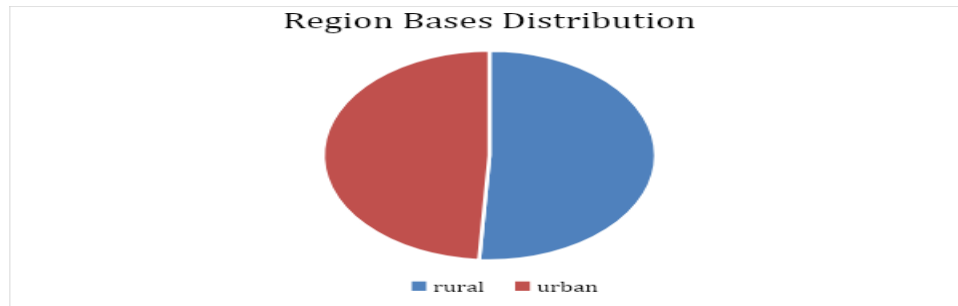


Figure 6: Region-Based Distribution

Table 7: Quadrant-Wise Distribution of Breast Disease

Quadrant	No. of cases	% of cases
UO	254	42.19
C	92	15.28
LO	76	12.62
UI	71	11.79
LI	23	3.82
WHOLE BREAST	17	2.82
UI/UO	1	0.17
LI/LO	2	0.33
UO/UI/LO	1	0.17
AXILLA	9	1.50

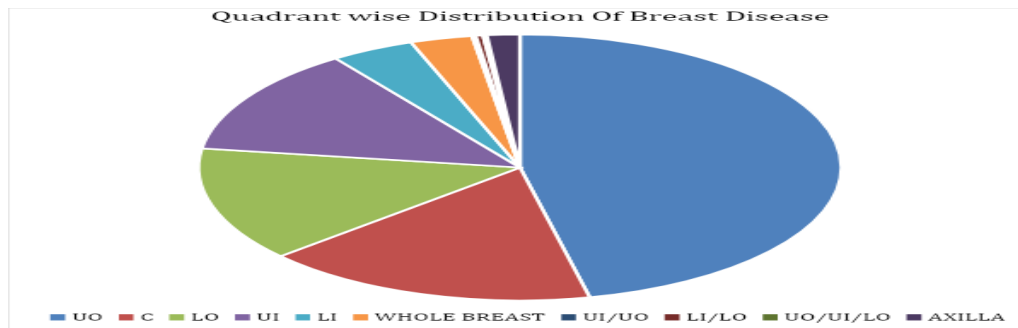
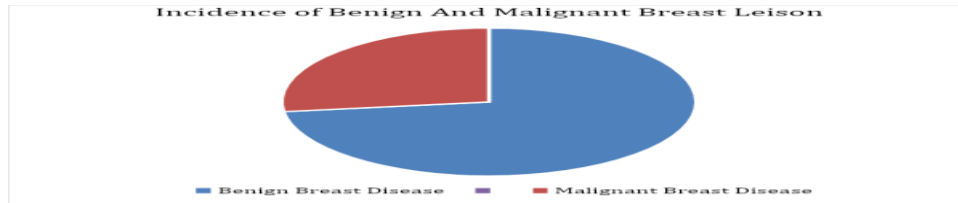


Figure 7: Quadrant-Wise Distribution of Breast Disease

**Table 8: Incidence of benign and malignant lesion of the breast**

Type of lesion	No. of cases	% of cases	Mean age
Benign breast disease	439	72.92	28.76
Malignant breast disease	163	27.08	49.87



**Figure 8: Incidence of benign and malignant lesion of the breast**

**Table 9: Distribution pattern of malignant lesion of the breast**

S. No.	Malignant lesion	No. of cases	% of cases
1	IDC	141	86.50
2	IDC With Lung Mets	3	1.84
3	IDC and ILC	3	1.84
4	Rec. IDC	3	1.84
4	IDC With Hepatic Mets	2	1.22
5	Malignant Low-Grade Phylloid	2	1.22
6	Adenocarcinoma	2	1.12
7	Locally Advance Breast Carcinoma	2	1.22
8	B/L IDC	1	0.61
9	IDC With Paget’s Disease	1	0.61
10	Intraductal Carcinoma	1	0.61
11	IDC With Dystrophic Calcification	1	0.61
12	Male Breast Carcinoma	1	0.61

**Table 10: Distribution of pattern of benign lesion of the breast**

S. no.	Benign lesion	No. of cases	% of cases
1	Fibroadenoma	216	49.2
2	Breast Abscess	85	19.36
3	Mastitis	22	5.01
4	Benign Proliferative Disease	15	3.41
5	Atypical Epithelial Hyperplasia	15	3.41
6	Gynaecomastia	13	2.96
7	Mastalgia	10	2.27
8	Fibroadenosis	13	2.96
9	Fibroadenoma with Fibroadenosis	8	1.82
10	Antibioma	8	1.82
11	Lipoma	6	1.36
12	Accessory breast	4	0.91
13	Fat necrosis	3	0.68
14	Pleomorphism with Necrosis	3	0.68
15	Cold Abscess	2	0.45
16	Duct Papilloma	2	0.45
17	Duct Ectasia	2	0.45
18	Phylloid tumor	2	0.45
19	Sebaceous cyst	2	0.45
20	Recurrent Sinus	2	0.45
21	Nipple Discharge	2	0.45
22	Sclerosing Adenosis	1	0.22
23	Nipple Adenoma	1	0.22
24	Tubular Adenoma	1	0.22
25	Apocrine Hyperplasia	1	0.22

**Table 11: Comparison of incidence of neoplastic and non-neoplastic lesion**

S. No.	Study	neoplastic		Non-neoplastic	
		No Cases	%	No. Of cases	%
1	Samir S et al. (1995).3	52	48.10%	56	51.90%
2	M S Siddiqui et al. (2003).4	2357	71.80%	922	28.90%
3	Nasser Ahmed Shaik et al (2012).5	2186	81%	507	18.83%
4	Present study	178	29.56%	424	70.43%

### Discussion

The benign spectrum of breast lesion includes fibroadenoma, breast abscess, fibroadenosis, gynecomastia, phylloid tumor, atypical epithelial hyperplasia, mastitis, mastalgia, duct papilloma, cold abscess, and the malignant spectrum includes ductal carcinoma, lobular carcinoma, mucinous carcinoma, medullary carcinoma, papillary carcinoma, metaplastic carcinoma. Breast lesions show female predominance when compared to males, and the histopathological spectrum of breast lesions varies amongst different countries and ethnic groups[8]. In general, benign breast lesions are more common than malignant lesions[9]. The risk factors for breast lesions include multiparity, early menarche, late menopause, lifestyle; all of this be to highlight the facts towards excessive circulating estrogen.

In our study, 602 patients were investigated; 72.92% comprised benign breast lesions, while malignant lesions constituted 27.07%. In western countries and Africa, the percentage of breast lesions usually high (10% and 21%, respectively)[10,11]. The most common benign lesion was found to be fibroadenoma 49.20% in our study and the most common malignant lesion in invasive duct carcinoma (86.50%) [Table 7]. Similar results are observed in other studies as well[12,13]. Patients, in general, present with locally advanced lesions due to lack of awareness, social stigma, fear of cancer, and the dearth of screening programs. With the increasing awareness and knowledge in the use of mammography in recent years, more women are being diagnosed with benign and malignant breast disease[14]. Early identification of benign and malignant lesions is crucial as they act as stimulants of malignancy, and the approach and management differ for both lesions. Invasive duct carcinoma was seen in 86.50% of cases. This incidence is almost equal, as shown in Malik and Bhardwaj's study (88.20%) and Kulkarni et al.'s study (84.85%) conducted in the years 2003 and 2009, respectively. Fibroadenoma is a commonly occurring benign breast in our study (49.20%). Risk factors include early menarche and late pregnancy or no pregnancies. Inflammatory breast lesions were seen in 19.36% of the cases and usually are a result of a systemic or target organ-specific disease, and the breast is usually the secondary location site. Gynecomastia is the enlargement of male breasts and was observed in 2.96% of cases. Benign phylloid tumor, duct papilloma, nipple adenoma were the other benign lesions with around 0.50% incidence each in this study. Benign phylloid tumor, in general, accounts for 2-3% Of all fibroepithelial breast disease and has a peak incidence in the perimenopausal age. The lesion has marked intraductal growth of intralobular stroma with leaf-like projection (phylloid-leaf), which is pathognomonic of this disease[15]. Duct papilloma usually presents with nipple discharge. Invasive duct carcinoma with distant metastasis was seen in 3.06% of our study. It has a high mortality rate due to the involvement of vital organs. The peak age of the occurrence of breast lesions was 20 to 25 years of age, which signifies that all women >20 years of age should undergo a screening process so that any breast can be diagnosed early and treated promptly. In our study, the mean age of benign breast disease was 28.7 years, and for malignant breast lesions, the mean age was 49.87 years. More awareness regarding breast should be launched, and the knowledge regarding the risk of breast cancer should be across the globe.

### Conclusion

In the present study, the most common benign lesion is fibroadenoma with a 49% incidence, and the most common malignant breast lesion is invasive duct carcinoma with 86.50%. Distance metastasis associated with invasive duct carcinoma was 03.06% with a poor prognosis. The peak age of breast lesions was 20-25 years; the mean age of benign lesions was 28.70, and the mean age of malignant is 49.87 years. The study emphasizes the importance of recognizing and treat benign lesions at an early stage and distinguish them from in situ and invasive breast carcinomas. Vivid importance should be given to assess a patient's risk of developing breast cancer so that the most appropriate treatment modality for each case can be established.

Histopathology plays a vital role in the diagnosis and treatment of breast along with mammography, sono-mammography, FNAC, tru-cut biopsy findings. The need of the hour is to conduct breast lesions screening programs, basic training, and motivation to the women to report to the doctor at an early stage in case any breast lump is noticed on breast self-examination, which, in turn, can reduce the morbidity and mortality associated with breast diseases.

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