

A Study of Histopathological Spectrum of Breast Lesions

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Abstract

Introduction: Breast cancer accounts for one-third of female cancers and approximately one-fourth of all malignancies. Malignancy not only poses a financial burden on the patient, their family, and society but also is responsible for emotional distress.

Aim: This study aims to evaluate the frequency, age, gender, and histopathological features of breast carcinoma in a tertiary care hospital.

Materials and Methods: This retrospective study was conducted in the Department of Pathology, Coimbatore Medical College and Hospital, from January 2017 to October 2018. Tissue for hematoxylin and eosin (H and E) sections was fixed in 10% formalin and subjected to routine paraffin-embedded processing and stained with H and E. The histopathological features were noted, and the tumors were diagnosed based on the WHO classification and graded adopting modified Bloom–Richardson grading system.

Results: Of the 120 specimens received, 116 specimens belonged to female patients (97%). The peak age of the occurrence of breast masses was in the 3rd decade (32% occurrence). Both malignant and non-malignant lesions were present in the specimens. Among the 98 benign lesions, 45 cases were of fibroadenoma (46%), 23 cases were of fibroadenosis (23%). Among the 22 malignant lesions, 17 cases were of infiltrative duct cell carcinoma (77%).

Conclusion: The pattern of breast lesions provides valuable information concerning clinicopathological profile of breast lesions. The clinical diagnosis of a breast lump must be correlated with histopathological diagnosis for correct and adequate treatment of patient.

Key words: Breast carcinoma, Fibroadenoma, Infiltrating ductal carcinoma

INTRODUCTION

Breast lesions are heterogeneous diseases that consist 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. Majority of the breast lesions initially present with a lump in the breast which is very sensitive for female patients due to which they might not report timely to the doctor for an examination.^[1] A timely and accurate diagnosis of a breast lump is crucial and early intervention alleviates anxiety and can be lifesaving. In recent years, breast lesions have gained increased importance

and global attention due to the increased mortality and morbidity associated with breast cancer and more awareness is being spread among women regarding breast lumps.^[1] Many studies have been conducted on the spectrum of breast lesions. The spectrum varies among various countries and ethnic groups. Concerning findings of breast lesions include a hard mass that is fixed and irregular in shape and firmly attached to the surrounding tissues. The causes of breast masses are fibrocystic changes, fibroadenomas, breast infection, galactocele, and breast cancer. Malignant lesions account for 10% of the breast masses.^[2]

The WHO statistics in 2008 states that malignant breast lesions comprise 1.38 million cases (10.9% of total cancer patients).^[3] Breast malignancy is the second most common malignancy in women after carcinoma cervix and is diagnosed in 20 in 100,000 women.^[4,5] Fortunately, a majority of the breast lesions are benign.^[6] The spectrum of benign breast lesions includes fibroadenoma, phyllodes tumor, gynecomastia, breast abscess, and chronic mastitis

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and the malignant spectrum includes ductal carcinoma, lobular carcinoma, colloid carcinoma, and medullary carcinoma. Treatment of breast masses depends on the underlying cause which may range from simple pain medication to surgical removal.^[7] Few cases might resolve without treatment. The incidence of benign breast lesions begins during the 2nd decade of life and increases gradually in the 4th and 5th decades while the incidence of malignant lesions increases after menopause.^[8]

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.^[9] The main purpose of the study is to analyze and highlight the histopathological spectrum and prevalence of breast lesions.

Aim

This study aims to evaluate the frequency, age, gender, and histopathological features of breast carcinoma in a tertiary care hospital.

MATERIALS AND METHODS

This retrospective study was conducted in the Department of Pathology, Coimbatore Medical College and Hospital, from January 2017 to October 2018. Inclusion criteria: All mastectomy specimens received for histopathological examination suspected for neoplastic and non-neoplastic lesions of the breast during the study period were included in the study. Exclusion criteria: Women with an obvious malignant disease or those who had been treated for malignancy earlier were excluded from the study. Among the 120 specimens, most of them were lumpectomy specimens and a few were mastectomy specimens. The clinical presentation, magnetic resonance imaging (MRI), fine-needle aspiration cytology (FNAC), mammography findings, and other relevant information were obtained from the histopathology registration form. The clinical details were recorded as per the pro forma along with mammography findings and related special investigations were taken into consideration. Fine-needle aspiration was done using non-aspiration technique except for cystic lesions. In the case of non-diagnostic aspirates, the procedure was repeated. The histopathological features were noted, and the tumors were diagnosed based on the WHO classification and graded adopting modified Bloom–Richardson grading system.

RESULTS

Of the 120 specimens received, 116 specimens belonged to female patients (97%) and four specimens belonged to male

patients (3%) [Figure 2]. The peak age of the occurrence of breast masses was in the 3rd decade (32% occurrence) followed by the 4th decade (26% occurrence) [Figure 1]. About 17 patients were aged <20 years and 13 patients were aged >50 years. The most common presenting symptom was a lump in the breast which was seen in 110 cases (92%) followed by discharge in the nipple which was seen in three patients. The remaining seven patients had both these symptoms [Figure 3]. Both malignant and non-malignant lesions were present in the specimens. Among the 98 benign lesions, 45 cases were of fibroadenoma (46%), 23 cases were of fibroadenosis (23%), 15 cases were of fibrocystic disease (15%), 6 cases were of gynecomastia (6%), 1 case each of benign phyllodes and duct papilloma, and 7 cases were of inflammatory origin. Fibroadenoma is the most common benign breast lesion in this study [Table 1 and Figure 4]. The smallest size of the benign lesion was 0.75 cm × 0.55 cm and the largest size was 12.5 cm × 10.5 cm.

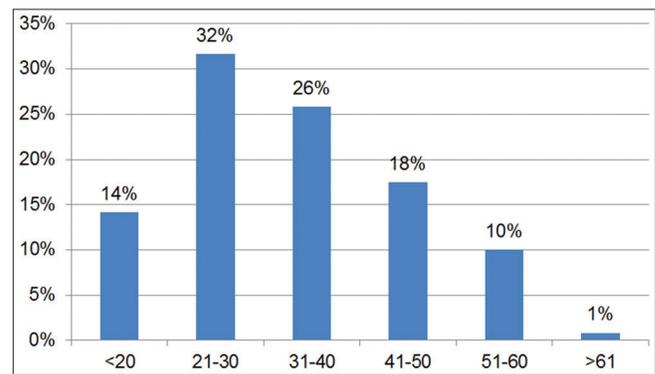


Figure 1: Age incidence of breast diseases

Table 1: Different histopathological lesions in benign breast lesions and malignant breast lesions

Histopathological diagnosis	Number of cases	Percentage of benign breast lesions (%)
Benign breast lesions, n=98		
Fibroadenoma	45	46
Fibroadenosis	23	23
Fibrocystic disease	15	15
Inflammatory	7	7
Gynecomastia	6	6
Benign phyllodes	1	1
Duct papilloma	1	1
Total	98	100
Malignant breast lesions n=22		
Infiltrative duct cell carcinoma	17	77
Medullary carcinoma	2	9
Invasive papillary carcinoma	1	5
Metaplastic carcinoma	1	5
Apocrine carcinoma	1	5
Total	22	100

Among the 22 malignant lesions, 17 cases were of infiltrative duct cell carcinoma (77%), two cases were of medullary carcinoma (9%), and one case each in invasive papillary carcinoma, metaplastic carcinoma, and apocrine carcinoma (5%) was seen. Among the malignant breast lesions, infiltrating duct cell carcinoma was the most

common [Table 1]. Among the 17 cases of infiltrating duct cell carcinoma, 65% accounted for Stage I and 35% accounted to Stage II. Metastatic lymph nodes were seen in 47% of the cases ($n = 8$). The size of the tumor was <2 cm in 3 cases (18%) and >2 cm in 14 cases (82%). The smallest size of the malignant lesion was 3 cm × 2.5 cm and the largest size was 11 cm × 10.5 cm.

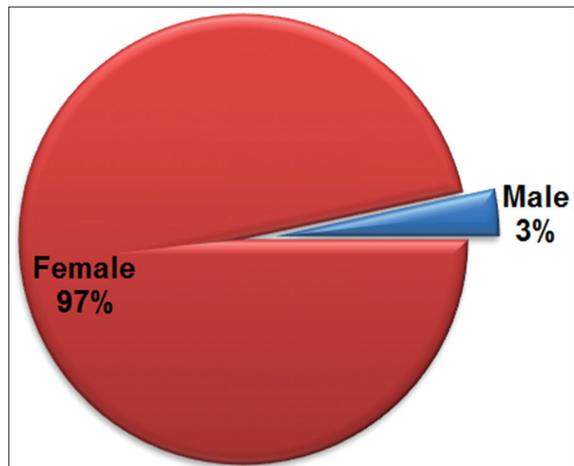


Figure 2: Gender distribution

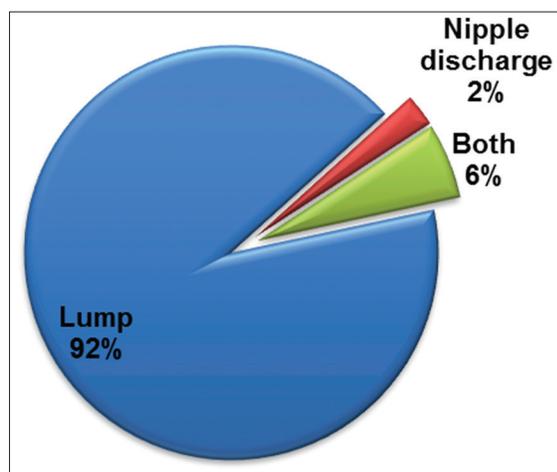


Figure 3: Presenting symptoms

DISCUSSION

The breast tissue is composed of specialized epithelium and stroma that is capable of turning into benign or malignant lesions. The human breast consists of six to 10 major duct systems. The overlying skin of the breast is lined by keratinizing squamous epithelium that dips into the orifices of the nipple and then abruptly changes to a double-layered cuboidal epithelium that continues to line the ducts. The larger ducts further branch and eventually lead to the terminal duct lobular unit. Two cell types line the ducts and lobules. They are the luminal epithelial cells that overlay the epithelial cells.^[10] The benign spectrum of breast lesions includes fibroadenoma, phyllodes tumor, mastitis, and breast abscess and the malignant spectrum includes ductal carcinoma, lobular carcinoma, tubular carcinoma, mucinous carcinoma, medullary carcinoma, papillary carcinoma, and metaplastic carcinoma. Breast lesions show a female predominance when compared to males and the histopathological spectrum of breast lesions varies among different countries and ethnic group.^[11] In general, benign breast lesions are more common than malignant breast lesions.^[12] The risk factors for breast lesions include multiparty, low parity, low age at first childbirth, and late menopause, all these to only highlight the fact toward excessive circulating estrogen.^[13,14]

In our study, of the 120 breast tissue specimens, 81.6% comprised benign breast lesions while 18.3% was constituted by malignant lesions. In western countries and Africa, the percentage of malignant breast lesions is usually

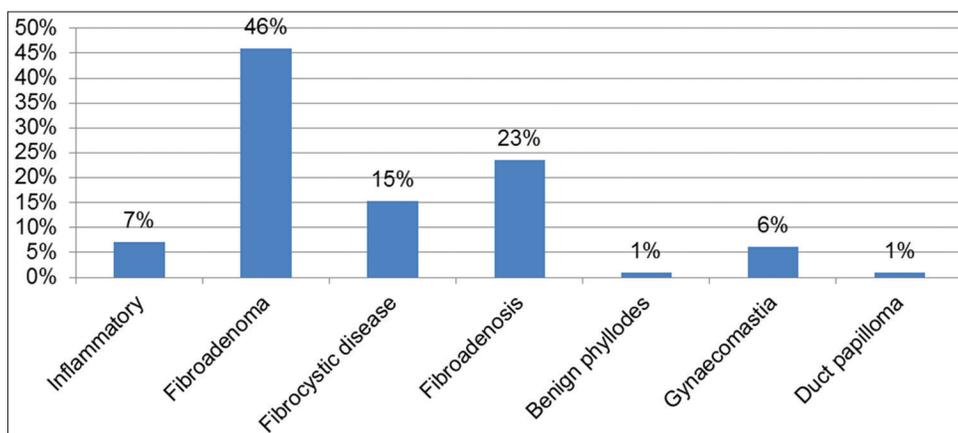


Figure 4: Benign breast lesion variants

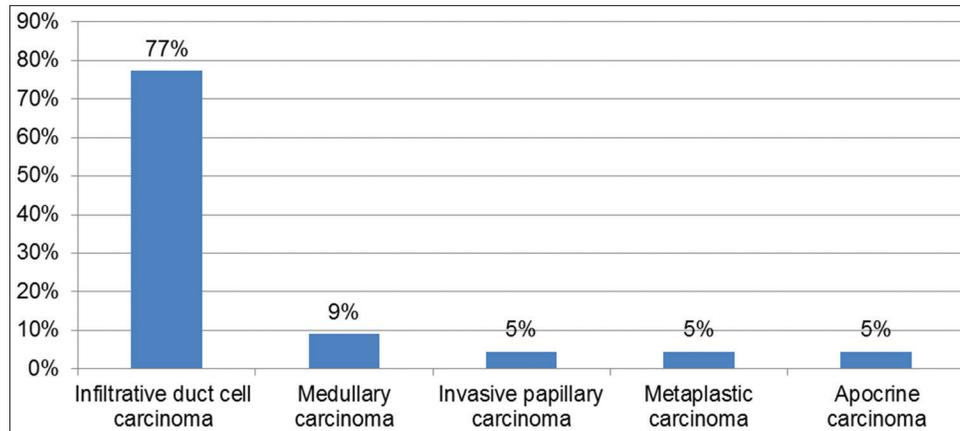


Figure 5: Malignant breast lesion variants

high (10% and 21%, respectively).^[15,16] The most common benign lesion was found to be fibroadenoma (46%) in our study and the most common malignant lesion is infiltrative duct cell carcinoma (77%) [Figure 5]. Similar results are observed in other studies as well.^[17,18] Fibroadenoma develops from a terminal duct lobular unit due to the uncoordinated proliferation of the epithelial and stromal component and it might involve a part of the surrounding tissues also which creates a pseudocapsule due to the expansive growth of the lesion.^[19] The stromal element of fibroadenoma undergoes myxoid degeneration such as sclerosis, hyalinization, or calcification while the epithelial element may present as proliferative or non-proliferative aspects of breast parenchyma which includes apocrine metaplasia, ductal hyperplasia, sclerosing adenosis, and florid adenosis which is defined as complex.^[20,21]

Patients, in general, present with locally advanced lesions due to lack of awareness and 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 diseases.^[22] Early identification of benign and premalignant lesions is crucial as they act as stimulants of malignancy and the approach and management differ for both the lesions. Infiltrative duct cell carcinoma was seen in 17 specimens, of the total 22 malignant specimens received (77% incidence). This incidence is lower than Malik and Bharadwaj study (88.20%) and Kulkarni *et al.* study (84.85%) conducted in the year 2003 and 2009, respectively.^[18,19] Fibroadenosis is the next commonly occurring benign breast lesion as observed in our study (23% incidence). Fibroadenosis is also known as fibrocystic disease and it is a condition where the breasts are painful, lumpy, or doughy. Risk factors include an early age at the first menstrual period and late pregnancies or no pregnancies. It is not an actual disease but represents normal breast changes and needs to be distinguished from the malignant lesion.^[23]

Inflammatory breast changes were seen in 7% of the specimens and these usually are a result of systemic or target organ-specific diseases and breast is usually the secondary location site. Gynecomastia is the enlargement of male breasts and was observed in 6% of the cases. Gynecomastia-like female lesions were also noticed in a few cases. Phyllodes tumor and duct papilloma were the other benign lesions with 1% incidence each in this study. Phyllodes tumor, in general, accounts for 2–3% of all fibroepithelial breast diseases and has a peak incidence in the perimenopausal age or can occur before 20 years of age. The lesion has marked intraductal growth of intralobular stroma with leaf-like projections (phyllodes leaf) which is pathognomonic of this disease.^[24] Ductal papilloma usually presents with secretion in the nipple.

Invasive duct carcinoma was seen in 5% in our study. It has a high mortality rate due to localized invasion, lymph node spread, and distant metastasis. Prognosis is usually poor with invasive type carcinoma. 65% of the cases were diagnosed in Stage I invasive duct carcinoma in our study and 35% was in Stage II disease. Metastasis was present in 47% of the cases. Apocrine carcinoma is a very rare form of female breast cancer with sparse information available in literature. They show estrogen and progesterone receptor negativity and androgen receptor positivity (ER–/PR–/AR+). Metaplastic breast cancer, a mixture of epithelial and mesenchymal components, is another rare malignancy occurring in <1% of the cases (5% in our study). About 92% of the cases presented with symptoms of a breast lump and 2.5% presented with nipple discharge. The rest had both the symptoms. The peak age of the occurrence of these breast lesions was the 3rd decade (21–30 years) which signifies that all women >20 years of age should undergo a screening process so that any breast disease can be diagnosed early and treated promptly. More awareness programs should be launched and the knowledge regarding the risk of breast cancer should be spread across the globe.

CONCLUSION

In the present study, the most common benign lesion is fibroadenoma with a 46% incidence and the most common malignant lesion is infiltrating ductal carcinoma with 77%. Distant metastasis was associated with infiltrative duct carcinoma (47%) with a poor prognosis. The peak incidence of benign lesions is in the age group of 21–30 years, and the peak incidence of malignancy is seen in 41–50 years. The study emphasizes the importance to recognize 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 an important role in the diagnosis and treatment of breast diseases along with mammography, MRI, and FNAC findings. The need of the hour is to conduct breast cancer screening programs and basic training and motivation to the women to report to the doctor at an early stage in case any breast lump is noticed on palpation which, in turn, can reduce the morbidity and mortality associated with breast tumors.

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