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Indian Journal of Pathology and Oncology

Journal homepage: www.ijpo.co.in

Original Research Article

Study of histomorphological spectrum of malignant breast diseases- In a tertiary care centre of Mumbai

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ARTICLE INFO

Article history:

Received 19-05-2021

Accepted 03-06-2021

Available online 12-08-2021

Keywords:

Breast

Infiltrating duct carcinoma

Phylloides

ABSTRACT

Introduction: Breast cancer is the most common cancer in women worldwide, comprising 16% of all -female cancers. It is by far the most frequent cancer in female, both in developed and developing regions and is second overall next only lung. In India, breast cancer is the most common cancer among women in many regions and has overtaken cervix cancer, which was the most frequent cancer a decade ago. As in other developing regions, the mortality rates for breast cancer in India are high in comparison to its incidence rates. A poor survival may be largely explained by the lack of or limited access to the early detection services and treatment. Though clinical examination of the breast lump and the age of the patient can provide information about the nature of the lump, Histopathological examination is necessary to establish the diagnosis.

Aim and Objective: To classify the breast lesions and study them with age, clinical presentation and various pathological parameters.

Materials and Methods: The present study of the breast lesions was performed in the department of pathology in a general teaching hospital and tertiary referral health care centre in Mumbai. All the assimilated data was collected and analysed to find the incidence and frequency of lesions.

Conclusion: Infiltrating duct carcinoma (IDC) is the most common breast malignancy. Grade-2 IDC's were more common than grade- 1 and grade-3 IDC's. Breast cancers were bulky and presented at an advanced stage in younger population. Breast carcinomas in our population presents as locally advanced cancer, with predominance of higher histological grade and higher stage in view of lack of or limited access to the early detection services and treatment.

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1. Introduction

Breast cancer is the most common cancer in women worldwide, comprising 16% of all -female cancers. It is by far the most frequent cancer in female, both in developed and developing regions and is second overall next only lung.^{1,2}

In Asian population the overall incidence as well as incidence in younger age group is increasing comprising 25% of breast cancers in young patients.³

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In India, breast cancer is the most common cancer among women in many regions and has overtaken cervix cancer, which was the most frequent cancer a decade ago.⁴

The age standardized mortality rate for breast cancer in India is 11.1 per 100000 (12.5 per 100000 globally).

As in other developing regions, the mortality rates for breast cancer in India are high in comparison to its incidence rates. A poor survival may be largely explained by the lack of or limited access to the early detection services and treatment.⁵

Though clinical examination of the breast lump and the age of the patient can provide information about the nature of the lump, Histopathological examination is necessary to establish the diagnosis.⁶

Though hormone receptor analysis is a prerequisite in this era, for management and prognosis, still histopathological grading can be taken up as an important variable for predicting prognosis. Carcinomas with ER/PR positivity have a good prognosis as compared to carcinomas with ER/PR negativity. Also histological grading has a bearing on the prognosis, as high grade have poor prognosis and vice versa.⁷

The present study endeavors to analyze histomorphology of various breast diseases retrospectively as well as prospectively in all age groups from the year 2002-2012 at a tertiary care centre.

2. Aims & Objectives

1. To study the frequency of breast cancers in all age groups and gender.
2. To study various types and classify them.
3. To study cancers with age, clinical presentation and various pathological parameters.
4. To examine the changing trends of breast cancers in given population.

3. Materials and Methods

The present study of the breast lesions was performed in the department of pathology in a general teaching hospital and tertiary referral health care centre in Mumbai. This study was conducted for the period of 10 years and 9 months. It was a prospective and retrospective study. All types of breast tissue specimens ranging from core biopsies to lumpectomies to mastectomies were included in this study. The Clinical data including age, sex, site of lesion, quadrant and size of tumor was recorded in each case. Gross finding recorded were size, circumscription, extent of lesion, appearance on cut surface i.e. solid or cystic nature, presence of areas of hemorrhage or necrosis and enlarged lymph nodes. Microscopically histological evaluation was done as regards type of lesion, histologic grade, lymph node status etc. All the above assimilated data was collected and analysed to find the incidence and frequency of lesions.

4. Observation

Total of 957 surgical specimens of breast were received in the department of pathology over study period which accounted for 1.66% of the total specimen received for histopathology. Of these benign breast lesions were 653 (68.3%) and malignant breast lesions were 304 (31.7%).

Table 3: Distribution of histological types of invasive ductal carcinoma [n= 246]

IDC With Extensive DCIS	05
IDC With Tubular Differentiation	05
Mixed Ductal And Lobular Carcinoma	04
IDC With Papillary Differentiation	02
IDC With Mucinous Differentiation	02
IDC With Solid Papillary+Mucinous	01
IDC With Neuroendocrine Differentiation	01
T otal	246



Fig. 1: Malignant phyllodes tumour- fungating growth involving nipple areolar & skin complex



Fig. 2: Modified radical mastectomy-Mucinous carcinoma-cut surface showing circumscribed lobules with glistening gelatinous mucin

Table 1: Distribution of malignant breast lesions [n=304]

Histological Type	Number of Cases	(%) of Total Cases	(%) of Malignant Lesions
Invasive Duct Carcinoma (IDC)	246	25.70	80.27
Invasive Papillary Carcinoma	31	03.23	10.54
Lobular Carcinoma	12	01.25	1.36
Mucinous Carcinoma	04	0.41	1.00
Malignant Phyllodes	03	0.31	0.68
DCIS With Microinvasion	02	0.20	0.68
Poorly Differentiated Carcinoma	02	0.20	0.68
Metaplastic Carcinom/Carcinosarcoma	02	0.20	0.68
Invasive Micropapillary With Large Intraductal Component	01	0.10	0.34
Paget's Disease	01	0.10	0.34
Total	304	31.7	100

Table 2: Age wise distribution of malignant breast lesions

Age (Years)	Invasive Ductal Carcinoma	Invasive Papillary Carcinoma	Invasive Lobular Carcinoma	Invasive Mucinous Carcinoma	Malignant Phyllodes
21-30	10	00	00	00	01
31-40	65	05	03	02	00
41-50	81	04	02	00	01
51-60	48	10	02	01	01
61-70	31	07	05	01	00
71-80	08	04	00	00	00
81-90	03	01	00	00	00
Total	246	31	12	04	03

Table 4: Age and grade correlation of infiltrating duct carcinoma (n=226)

Age (Years)	IDC-Grade-I	IDC-Grade-II	IDC-Grade-III	Total
21-30	01	04	05	10
31-40	18	22	24	64
41-50	27	31	12	70
51-60	08	23	12	43
61-70	09	13	07	29
71-80	03	04	00	07
81-90	03	00	00	03
Total	69(30.5%)	97(43%)	60(26.5%)	226

Table 5: Size of tumor

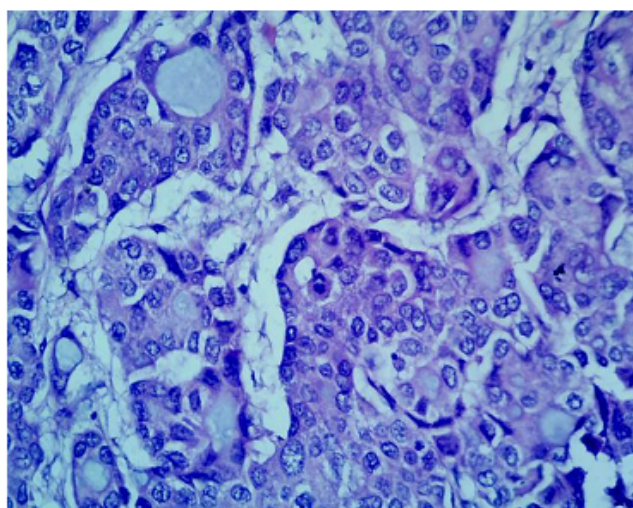
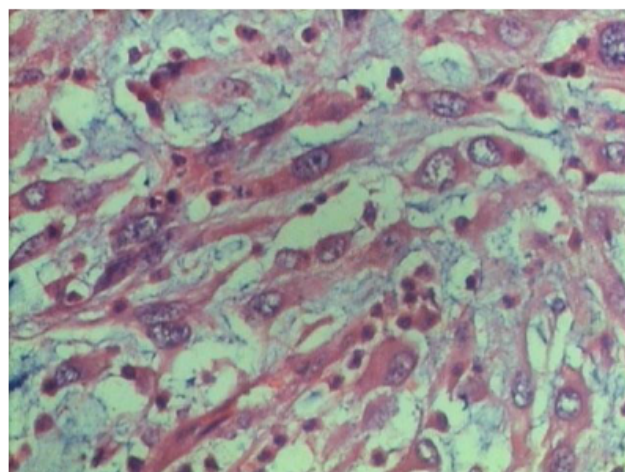
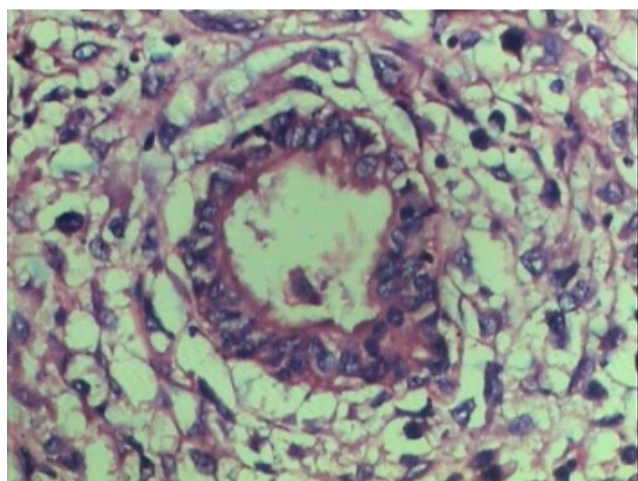
Size of Tumor	T1 (<2 CM)	T2 (2 -5 CM)	T3 (>5 CM)	Total
Number of Cases	86	119	70	275

Table 6: Lymph nodes involvement

	Total No. of Cases
No Lymph node involvement	48
Minimal /I Lymph Nodes Involvement	24
All Lymph Nodes Involvement	23

Table 7: Comparative chart of malignant lesions studied by various authors

Study Group	Invasive Ductal Carcinoma	Invasive Papillary Carcinoma	Invasive Lobular Carcinoma	Mucinous Carcinoma	Malignant Phyllodes	DCIS With Micro Invasion
Siddiqui et al ⁸ 1996	1224 (37%)	9	30(1%)	10	-	-
Singh et al ⁹ 2000	22 (14.4%)	-	1(0.6%)	-	1(0.6%)	-
Chiedozi et al ¹⁰ 2003	38 (5.36%)	-	1(0.1%)	-	-	3 (0.4%)
Parajuli et al ⁶ 2011	9 (7.9%)	-	1(0.8%)	-	-	2 (1.7%)
Nasser Ahmed S. et al ¹¹ 2012	789 (29.3%)	16(0.6%)	38 (1.4%)	14 (0.5%)	11(0.4%)	-
Present Study 2012	246 (25.7%)	31(3.2%)	12 (1.2%)	4 (0.4%)	3 (0.3%)	2 (0.2%)

**Fig. 3:** Infiltrating duct carcinoma-grade 2-Tubules formation, moderate pleomorphism, vesicular nuclei & Atypical mitosis (H& E 400X)**Fig. 5:** Malignant phyllodes - stromal cells with highly pleomorphic atypical nuclei, large macronucleoli, eosinophilic cytoplasm (H& E 400X)**Fig. 4:** Invasive Lobular carcinoma- Targetoid pattern showing malignant signet ring cells surrounding the duct (H & E 400X)

5. Discussion

Malignant lesions in our study comprised of 304(31.7%) of all the total breast lesions. Naseer Ahmed et al.¹¹ found the incidence of malignant breast lesions as 889(30.01%) which is similar to our study. Parajulis et al.⁶ in 2011, Chiedozi et al.¹⁰ in 2003 and Singh et al.⁹ in 2000 showed lower incidence i.e. 14 cases (12.2%), 43 cases (8.6%) and 28 cases (18.42%) respectively compared to present study. The study of Siddiqui et al.⁸ showed a rather higher incidence 1350 cases (41.1%) than present study.

We observed that malignant lesions were commonly seen in age range of 31 to 70 years of age with peak incidence in 41 to 50 years of age.

Among malignant lesions of the breast, Infiltrating Duct Carcinoma (IDC) is the most common malignancy comprising of 25.7%(246 cases) of total breast lesions and it is second most common lesion in the total breast lesions.

Naseer Ahmed et al.¹¹ noted similar incidence (29.3%) as that in our study. Parajuli et al.⁶ (7.9%), Singh et al.⁹ (14.4%) and Chiedosi et al.¹⁰ (5.3%) reported incidence of Infiltrating Duct Carcinomas lower than our study whereas Siddiqui et al.⁸ study showed higher incidence (37%) of infiltrating duct carcinoma as compared to present study.

Modified Bloom Richardson (MBR) grading system was available in 226 cases of infiltrating duct carcinomas (IDC), out of which 97 cases(43%) showed grade -2 IDC which outnumbered grade-1 IDC [69 cases(30.5%)] and grade-3 IDC [60 cases(26.5%)] in our study. Siddiqui et al.⁸ study showed 111 cases (11.3%) of grade 1, 577 cases(59.1%) of grade 2 and 287 cases (29.4%) of grade 3 IDC. This showed grade-2 IDC outnumbered grade-1 and 3 which is similar to our findings.

We observed that grade 1 and grade 2 IDC cases were clustered in a age group of 41 to 50 years whereas peak incidence of grade 3 were seen in 31-40 years of age

Second most common malignant lesion in our study was Invasive Papillary Carcinoma accounting for 3.2% (31 cases) of total breast lesions.

Naseer Ahmed et al.¹¹ found 16 cases (0.6%) and Siddiqui et al.⁸ showed 9 cases of Invasive Papillary Carcinoma. These studies showed lower incidence compared to our present study

The next common malignancy is Invasive Lobular Carcinoma comprising of 1.2% (12 cases) of total breast cases, Naseer Ahmed et al.¹¹ noted higher incidence 1.4%(38 cases) of Invasive Lobular Carcinoma as compared to present study. Singh et al.,⁹ Chiedosi et al.¹⁰ and Parajuli et al.⁶ each showed 1 case of Invasive Lobular Carcinoma.

In the present study, we had 4 cases of Mucinous Carcinoma. Naseer Ahmed et al.¹¹ showed 14 cases and Siddiqui et al.⁸ showed 10 cases of Mucinous Carcinoma respectively

Present study revealed only 3 cases of Malignant Phyllodes. None of them showed any heterologous stromal element. Naseer Ahmed et al.¹¹ showed 11 cases and Singh et al.⁹ showed only 1 case of Malignant Phyllodes.

We have got 2 cases of Ductal carcinoma in situ(DCIS) with microinvasion in present study, M. S. Siddiqui⁸ study showed 21 cases of DCIS whereas Chiedosi et al.¹⁰ showed 3 cases and Parajuli et al.⁶ noted 2 cases respectively.

2 cases of Metaplastic carcinomas was detected in our study whereas Siddiqui et al.⁸ showed single case of the same.

In the present study we had occasional case of Invasive Micropapillary carcinoma with large intraductal component and single case of Paget's disease in a 60 years old woman.

In present study, there were 4 cases of male breast cancers, out of which 3 cases of Invasive Papillary Carcinomas, aged 73 years, 64 years and 33 years respectively and 1 case of Invasive Ductal Carcinoma grade II seen in 55 years old male. In Ndom P et al.¹² study,

concluded that male breast cancers are late in onset. This study is keeping with our present study.

Out of 275 cases of available data of tumor size, we had 86 cases (31.3%) with tumor size < 2 cm (T1) and 189 cases (68.7%) of tumor size 2 or >2 cm. This is comparable to Siddiqui et al. study,⁸ which showed 33 cases (7%) of tumor with <2 cm size and 471 case (93%) with tumor size 2 or >2cm. This indicates large number of cases showed locally advanced breast cancer diseases.

Present study showed 24 cases of minimal or one lymph node involvement. No lymph node involvement or free axillas were seen in total 24 cases whereas all lymph node involvement were seen in 23 cases of Invasive carcinomas. The presence of axillary nodal metastasis and size of the primary tumour are the most widely accepted prognostic factors for operable breast cancer.¹³

In microscopic features, our study showed cutaneous involvement in 38 cases, lymphovascular emboli in 86 cases and perineural involvement in 14 cases.

In total 4 cases of distant metastasis, 2 cases showed lung metastasis, 1 case of liver metastasis and remaining one showed bone metastasis. All cases were grade III Invasive duct carcinoma

6. Conclusion

Infiltrating duct carcinoma (IDC) is the most common breast malignancy. grade -2 IDC's were more common than grade-1 and grade-3 IDC's.

Peak incidence of Infiltrating duct carcinoma (IDC) grade-3 was seen in age group of 31-40 years whereas peak incidence of Infiltrating duct carcinoma (IDC) grade 1 and 2 were seen within 41-50 years of age. In our study age at presentation for carcinomas is found to be younger as compared to that in western literature.

Incidence of malignancy in male breast is uncommon with invasive papillary carcinoma being the most common histological variant.

Majority of breast malignancies presented when they were in size range of 2-5 cms thus signifying that breast cancers were bulky and presented at an advanced stage in our population. Present study showed 47cases of lymph node involvement and 24 cases with free axillas.

In our study Grade 3 Invasive ductal carcinomas present with cutaneous involvement, Lymphovascular emboli, Perineural invasion and hence distant metastasis. It shows that histological grading has a bearing on the prognosis, as high grade have poor prognosis and vice versa.

Breast carcinomas in our population presents as locally advanced cancer, with predominance of higher histological grade and higher stage in view of lack of or limited access to the early detection services and treatment.

7. Source of Funding

None.

8. Conflict of Interest

The authors declare that there is no conflict of interest.


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Cite this article: Wakkar DN, Dorkar PS, Mane VP. Study of histomorphological spectrum of malignant breast diseases- In a tertiary care centre of Mumbai. *Indian J Pathol Oncol* 2021;8(3):334-339.