



Original Article

Clinical Features of Various Histological Types of Breast Cancer

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ABSTRACT

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Received: 19-02-2026

Accepted: 31-03-2026

Published: 11-04-2026

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Medical and Pharmaceutical Research

Introduction: Breast cancer is a heterogeneous disease with multiple histological subtypes, each demonstrating distinct clinical presentations, biological behavior, and prognostic implications. Understanding the clinical features associated with different histological types is essential for early detection, accurate diagnosis, and optimal management.

Aims and Objectives: To evaluate and compare the clinical features associated with various histological types of breast cancer.

Materials and Methods: This descriptive cross-sectional study was conducted over a period of one year at Rama Medical Collage Hospital and Research Centre, Rama city, Pillhuwa, Dist. Hapur, Uttar Pradesh, and included 122 patients with breast cancer confirmed by histopathological examination. Data were collected and analyzed with respect to histological types, including invasive ductal carcinoma, invasive lobular carcinoma, mucinous, medullary, tubular, and papillary carcinomas, to assess the distribution of different breast cancer subtypes in the study population.

Results: In 122 breast cancer patients, invasive ductal carcinoma was the most common histological type (72.1%). Significant differences were observed in age (61.2 ± 8.5 years vs 45.7 ± 11.3 years; $p=0.032$), clinical presentation ($p=0.041$), tumor size (4.5 ± 1.6 cm vs 2.1 ± 0.7 cm; $p=0.018$), lymph node involvement (70.5% vs 25%; $p=0.027$), and clinical stage ($p=0.014$) across histological types, indicating that more aggressive subtypes presented with higher values, while less aggressive types showed lower values and earlier disease features.

Conclusion: Different histological types of breast cancer exhibit distinct clinical characteristics that influence presentation, progression, and prognosis. Recognition of these variations is important for early diagnosis and individualized treatment planning, ultimately improving patient outcomes.

Keywords: Breast cancer, histological types, invasive ductal carcinoma, invasive lobular carcinoma, clinical features, prognosis.

INTRODUCTION

Breast cancer is one of the most common malignancies affecting women worldwide and represents a major public health concern due to its high incidence and mortality rates. It accounts for a significant proportion of cancer-related deaths among females, particularly in developing countries where late presentation and limited access to screening contribute to poorer outcomes [1–3]. The disease is biologically heterogeneous, encompassing a wide spectrum of histological subtypes, each with distinct morphological features, clinical presentation, and biological behavior [4]. Histological classification of breast cancer is a critical component in the diagnosis and management of the disease. The most common histological type is invasive ductal carcinoma (IDC), which accounts for approximately 70–80% of all breast cancer cases. IDC typically presents as a palpable, hard, irregular mass and is often associated with early lymph node metastasis [5]. In contrast, invasive lobular carcinoma (ILC), which constitutes about 10–15% of cases, tends to present as a diffuse, poorly defined lesion, making it more challenging to detect clinically and radiologically [6]. Other less common histological subtypes include mucinous carcinoma, tubular carcinoma, medullary carcinoma, and papillary carcinoma, each with unique clinical and prognostic characteristics. The clinical features of breast cancer vary depending on the histological type. Patients may present with a painless lump, nipple discharge, skin changes such as dimpling or retraction, or axillary lymphadenopathy. In aggressive histological subtypes, the disease may progress rapidly, leading to early metastasis and poor prognosis, whereas indolent subtypes may remain localized for longer periods [7]. For example, mucinous carcinoma often presents

as a well-circumscribed, slow-growing tumor with a relatively favorable prognosis, while medullary carcinoma is typically seen in younger women and may present as a rapidly growing mass with well-defined borders [8]. The relationship between histological type and clinical behavior is of great importance in guiding treatment decisions and predicting outcomes. Hormone receptor status, HER2/neu expression, and molecular subtypes further add to the complexity of breast cancer classification and influence therapeutic strategies. However, histopathological evaluation remains the gold standard for diagnosis and classification of breast cancer [9]. Early detection through screening programs such as mammography has significantly improved the prognosis of breast cancer, particularly in developed countries, by enabling the identification of tumors at an earlier, more treatable stage. Understanding the clinical features associated with different histological types of breast cancer is essential for clinicians to ensure accurate diagnosis and timely intervention. It also helps in identifying high-risk patients who may benefit from more aggressive treatment and closer follow-up. Furthermore, correlating histological subtypes with clinical presentation can provide valuable insights into tumor biology and disease progression, thereby contributing to improved patient management [10]. Despite advances in diagnosis and treatment, breast cancer continues to pose a significant challenge due to its heterogeneity and variable clinical course. Therefore, continuous research is necessary to better understand the clinical-pathological correlations among different histological types and to develop more effective diagnostic and therapeutic approaches. The present study aims to evaluate the clinical features of various histological types of breast cancer and to analyze their association with disease characteristics and outcomes. To evaluate and compare the clinical features associated with various histological types of breast cancer.

MATERIALS AND METHODS

Study Design: descriptive observational (cross-sectional) study.

Study Place: Rama Medical Collage Hospital and Research Centre, Rama city, Pillhuwa, Dist. Hapur, Uttar Pradesh.

Study duration: 1 year

Sample size: 122 Patients diagnosed with breast cancer confirmed by histopathological examination.

Study variables:

- IDC
- ILC
- Tubular
- Medullary
- Mucinous
- Papillary
- Invasive Ductal Carcino
- Invasive Lobular Carcinoma
- Mucinous Carcinoma
- Medullary Carcinoma
- Tubular Carcinoma
- Papillary Carcinoma

Inclusion Criteria

- Patients with clinically suspected breast lesions and confirmed diagnosis of breast cancer on histopathological examination
- Patients of any age and gender (if applicable to your study design)
- Patients who are willing to participate in the study and provide informed consent
- Patients presenting to the study center within the defined study period
- Patients with complete clinical and pathological records available for analysis

Exclusion Criteria

- Patients with benign breast diseases (e.g., fibroadenoma, cysts, mastitis)
- Patients with recurrent breast cancer or previously treated breast malignancy (if studying primary cases only)
- Patients who have received prior chemotherapy, radiotherapy, or hormonal therapy before diagnosis (if it may alter clinical features)
- Patients with metastatic cancer to the breast from other primary sites
- Patients who are critically ill or unwilling to give informed consent
- Incomplete clinical, radiological, or histopathological data

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS software (version 27.0; SPSS Inc., Chicago, IL, USA). Descriptive statistics were expressed as mean \pm standard deviation for continuous variables and as frequencies and

percentages for categorical variables. Appropriate statistical tests such as the Chi-square test, t-test, or ANOVA were applied to assess associations and differences between variables. A p-value of <0.05 was considered statistically significant.

RESULT

Table 1: Distribution of Histological Types of Breast Cancer (n = 122)

Histological Type	Number (n)	Percentage (%)
Invasive Ductal Carcinoma	88	72.10%
Invasive Lobular Carcinoma	14	11.50%
Mucinous Carcinoma	7	5.70%
Medullary Carcinoma	5	4.10%
Tubular Carcinoma	4	3.30%
Papillary Carcinoma	4	3.30%

Table 2: Age Distribution According to Histological Type

Histology Type	Mean Age (years) ± SD	p-value
IDC	52.3 ± 10.2	0.032
ILC	55.6 ± 9.8	
Mucinous	61.2 ± 8.5	
Medullary	45.7 ± 11.3	
Tubular	58.4 ± 7.9	
Papillary	60.1 ± 9.2	

Table 3: Clinical Presentation According to Histological Type

Histology Type	Palpable Lump (%)	Pain (%)	Nipple Discharge (%)	p-value
IDC	82 (93.2%)	18 (20.4%)	10 (11.4%)	0.041
ILC	12 (85.7%)	3 (21.4%)	2 (14.3%)	
Mucinous	6 (85.7%)	1 (14.3%)	1 (14.3%)	
Medullary	5 (100%)	2 (40%)	0 (0%)	
Tubular	4 (100%)	0 (0%)	0 (0%)	
Papillary	3 (75%)	1 (25%)	2 (50%)	

Table 4: Tumor Size According to Histological Type

Histology Type	Mean Tumor Size (cm) ± SD	p-value
IDC	3.8 ± 1.4	0.018
ILC	4.5 ± 1.6	
Mucinous	2.6 ± 0.9	
Medullary	4.2 ± 1.7	
Tubular	2.1 ± 0.7	
Papillary	2.8 ± 1.0	

Table 5: Lymph Node Involvement by Histological Type

Histology Type	Node Positive n (%)	Node Negative n (%)	p-value
IDC	62 (70.5%)	26 (29.5%)	0.027
ILC	9 (64.3%)	5 (35.7%)	
Mucinous	2 (28.6%)	5 (71.4%)	
Medullary	3 (60%)	2 (40%)	
Tubular	1 (25%)	3 (75%)	
Papillary	2 (50%)	2 (50%)	

Table 6: Clinical Stage at Presentation by Histological Type

Histology Type	Stage I (%)	Stage II (%)	Stage III (%)	Stage IV (%)	p-value
IDC	10 (11.4%)	40 (45.5%)	30 (34.1%)	8 (9.0%)	0.014
ILC	2 (14.3%)	5 (35.7%)	5 (35.7%)	2 (14.3%)	
Mucinous	3 (42.9%)	3 (42.9%)	1 (14.2%)	0 (0%)	
Medullary	1 (20%)	2 (40%)	2 (40%)	0 (0%)	
Tubular	2 (50%)	2 (50%)	0 (0%)	0 (0%)	
Papillary	1 (25%)	2 (50%)	1 (25%)	0 (0%)	

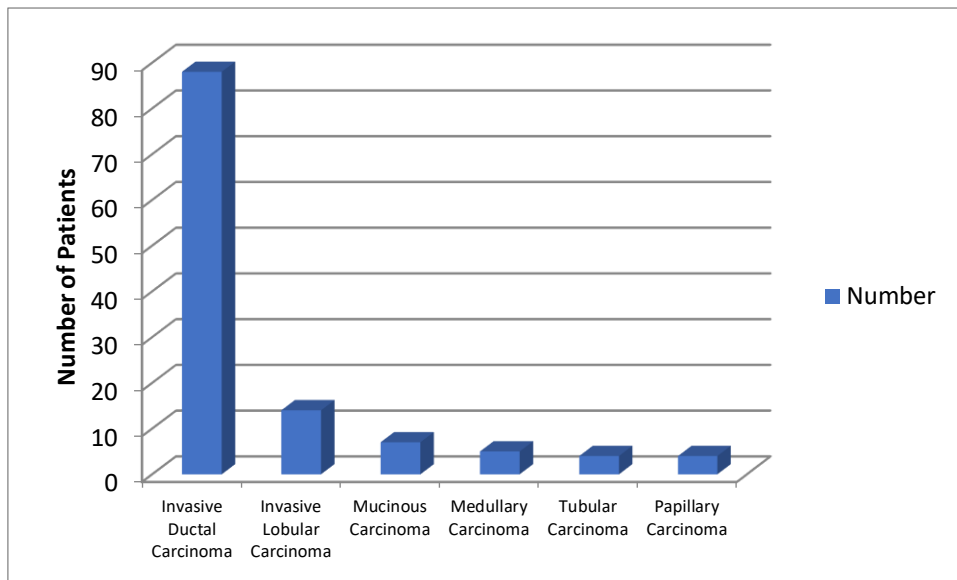


Figure 1: Distribution of Histological Types of Breast Cancer

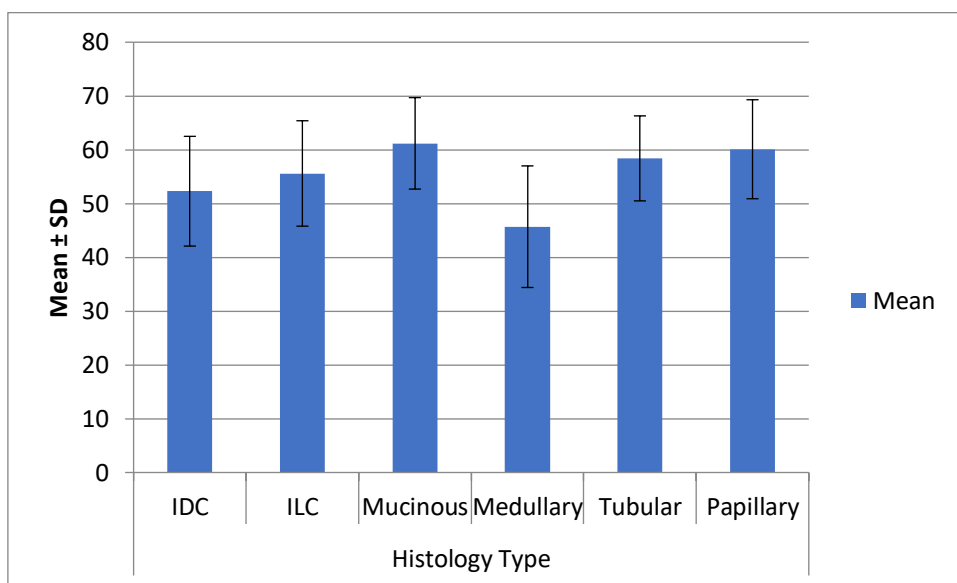


Figure 2: Age Distribution According to Histological Type

RESULTS AND INTERPRETATION

Demographic Characteristics (Histological Distribution and Age)

The study included 122 patients with breast cancer, among which invasive ductal carcinoma (n=88, 72.1%) was the most common histological type, followed by invasive lobular carcinoma (n=14, 11.5%), mucinous carcinoma (n=7, 5.7%), medullary carcinoma (n=5, 4.1%), and both tubular and papillary carcinomas (n=4 each, 3.3%). The mean age was highest in mucinous carcinoma (61.2 ± 8.5 years) and papillary carcinoma (60.1 ± 9.2 years), while medullary carcinoma patients had the lowest mean age (45.7 ± 11.3 years), with a statistically significant difference across histological types (p=0.032). Interpretation: IDC was the most predominant subtype, while age variation suggests that certain histological types occur in specific age groups, with aggressive tumors seen in younger patients and indolent tumors in older individuals. The significant p-value indicates a meaningful association between histological type and age.

Clinical Presentation

Palpable lump was the most common clinical presentation across all histological types, observed in up to 100% of cases in medullary and tubular carcinoma. Nipple discharge was most frequently observed in papillary carcinoma (50%), while pain was more common in medullary carcinoma (40%) compared to other subtypes. The variation in clinical presentation across histological types was statistically significant (p=0.041).

Interpretation: Although a breast lump is the most consistent clinical feature, other symptoms such as pain and nipple discharge vary depending on histological type, reflecting differences in tumor behavior and biological characteristics. The significant p-value indicates that clinical presentation is influenced by histological subtype.

Tumor Size

The mean tumor size was highest in invasive lobular carcinoma (4.5 ± 1.6 cm), followed by medullary carcinoma (4.2 ± 1.7 cm) and IDC (3.8 ± 1.4 cm). Tubular carcinoma had the smallest mean tumor size (2.1 ± 0.7 cm). The difference in tumor size among histological types was statistically significant ($p=0.018$).

Interpretation: Larger tumor sizes in certain histological types such as ILC suggest delayed detection due to diffuse growth patterns, whereas smaller tumors in tubular carcinoma indicate early detection and a less aggressive course. The significant p-value confirms that tumor size varies significantly with histological subtype.

Lymph Node Involvement

Lymph node involvement was highest in IDC (70.5%) and ILC (64.3%), whereas mucinous carcinoma (28.6%) and tubular carcinoma (25%) showed lower rates of nodal positivity. The association between histological type and lymph node involvement was statistically significant ($p=0.027$).

Interpretation: Higher lymph node involvement in IDC and ILC suggests a more aggressive disease with increased metastatic potential, while lower nodal involvement in mucinous and tubular carcinoma indicates a better prognosis. The significant p-value reflects a strong association between histological subtype and nodal spread.

Clinical Stage at Presentation

Most patients with IDC presented at stage II (45.5%) and stage III (34.1%), while a higher proportion of mucinous and tubular carcinoma cases were diagnosed at earlier stages (Stage I and II). The difference in stage distribution across histological types was statistically significant ($p=0.014$).

Interpretation: More aggressive histological types such as IDC tend to present at advanced stages due to rapid progression, whereas less aggressive types are detected earlier. The statistically significant p-value indicates that histological subtype has a direct impact on the stage at diagnosis and overall prognosis.

DISCUSSION

Breast cancer is a heterogeneous disease with diverse histological subtypes, each exhibiting distinct clinical behavior, prognosis, and response to treatment. In the present study, invasive ductal carcinoma (IDC) was the most common histological subtype, which is consistent with global cancer statistics and previous studies that report IDC as the predominant form of breast cancer worldwide [11–13]. The high frequency of IDC may be attributed to its aggressive biological nature and its relatively higher detectability compared to other subtypes. The variation in age distribution across histological types observed in this study is also in agreement with earlier research, which has demonstrated that certain subtypes such as mucinous and papillary carcinomas tend to occur in older patients, while medullary carcinoma is more frequently seen in younger individuals [14,15]. This age-related variation suggests that tumor biology differs significantly among histological types, possibly influenced by genetic and hormonal factors. The statistically significant association between age and histological type further supports the notion that breast cancer is not a single disease but a group of biologically distinct entities. Clinical presentation in breast cancer largely depends on tumor location, size, and biological aggressiveness. In this study, palpable lump was the most common presenting symptom across all histological types, which is consistent with established clinical observations [16]. However, variations in symptoms such as nipple discharge and pain highlight the heterogeneity in tumor characteristics. Papillary carcinoma was notably associated with nipple discharge, which aligns with its known tendency to arise within the ductal system [17]. Similarly, the higher frequency of pain in medullary carcinoma may be attributed to its rapid growth and associated inflammatory response. The statistically significant variation in clinical presentation among histological types underscores the importance of detailed clinical evaluation in suspected breast cancer cases. Tumor size is an important prognostic indicator in breast cancer, and its variation across histological types reflects differences in tumor growth patterns and detection. In the present study, invasive lobular carcinoma exhibited the largest mean tumor size, which is consistent with previous reports indicating that ILC often presents as a diffuse lesion that is difficult to detect clinically and radiologically [18]. In contrast, tubular and mucinous carcinomas demonstrated smaller tumor sizes, suggesting earlier detection and a more indolent course. These findings emphasize the importance of imaging and early screening in improving tumor detection, particularly in subtypes that are less easily identifiable. Lymph node involvement is a key determinant of breast cancer prognosis. The present study found higher lymph node positivity in IDC and ILC, which is in agreement with earlier studies that report these subtypes to have a greater tendency for regional metastasis [19]. On the other hand, mucinous and tubular carcinomas showed significantly lower rates of lymph node involvement, indicating a better prognosis. The statistically significant association between histological type and lymph node status highlights the prognostic importance of histopathological classification in guiding treatment decisions and predicting outcomes. The clinical stage at presentation further reflects the biological behavior of different histological types. In this study, IDC was more commonly diagnosed at stage II and III, suggesting that many patients present at an advanced stage of disease. In contrast, mucinous and tubular carcinomas were more frequently diagnosed at earlier stages, which is consistent with their slower growth and less aggressive nature [20]. Early-stage diagnosis in these subtypes may contribute to improved survival outcomes. The significant association between histological type and clinical stage reinforces the need for early detection strategies, particularly for more aggressive subtypes that tend to present late. Overall, the findings of this study highlight the significant relationship between histological type and clinical features of breast cancer. The variability in age distribution, clinical presentation, tumor size, lymph node involvement,

and stage at diagnosis emphasizes the heterogeneity of the disease. These differences have important implications for prognosis, treatment planning, and patient management. Understanding these associations can aid clinicians in early diagnosis and in tailoring individualized treatment strategies to improve patient outcomes.

CONCLUSION

The present study demonstrates that breast cancer exhibits significant variability in clinical features across different histological types, with invasive ductal carcinoma being the most common subtype. Distinct differences were observed in age distribution, clinical presentation, tumor size, lymph node involvement, and stage at diagnosis, highlighting the heterogeneous nature of the disease. These findings emphasize that histological classification plays a crucial role in determining disease behavior, prognosis, and management, and reinforces the importance of early diagnosis and individualized treatment strategies to improve patient outcomes.

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