

HISTOPATHOLOGICAL SPECTRUM OF BREAST LESIONS IN A TERTIARY CARE CENTRE IN AHMEDABAD

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Abstract:

Background: Breast cancer accounts for about one-third of female cancers and nearly about one-fourth of all malignancies. Breast carcinoma, in India, is the second most common malignancy after carcinoma cervix. Well timed and precise detection of a lump in the breast and prompt intervention can reduce not only the concern but is also lifesaving in many. We wanted to study the histopathological spectrum and prevalence of breast lesions. This study investigates the histopathological profile of breast lesions in a tertiary care center in Ahmedabad. **Methods:** **Study Population:** The study included 122 individuals who underwent breast biopsies. **Parameters Analyzed:** Data on age, sex, laterality, type of biopsy, and microscopic findings

were collected. **Microscopic Analysis:** All biopsy samples were subjected to detailed histopathological examination. The histopathological features were studied, and the various entities were diagnosed based on the WHO classification of tumors of the Breast. **Results:** A total of 122 cases were analyzed. The age and sex distribution of individuals with breast lesions were assessed. The occurrence of lesions in the left or right breast was documented. The type of biopsy procedure performed was categorized. The histopathological spectrum of breast lesions, including benign and malignant lesions, was documented. **Conclusion:** This study provides valuable insights into the histopathological diversity of breast lesions in a tertiary care setting in Ahmedabad. Understanding the prevalence and types of breast lesions can aid in early diagnosis and effective management.

Keywords: Breast Lesions, Histopathology, Tertiary Care Centre, Ahmedabad, Age, Sex, Laterality, Type of Biopsy, Microscopy.

Introduction

In India, the second most common malignancy after cervical carcinoma is carcinoma breast¹ and is seen in 20/1,00,000 women.² Lesions of the breast are diverse including several entities with remarkably diverse characteristic features³ extending from inflammatory non-neoplastic and benign lesions to life threatening invasive carcinomas.^[1]

Breast lesions encompass a wide range of pathological conditions, from benign alterations to malignant tumors, and their diagnosis plays a pivotal role in the management of breast lesion. Understanding the histopathological spectrum of breast lesions is essential for early detection, appropriate treatment, and improved patient outcomes. In the context of breast lesions, tertiary care centers assume a crucial role due to their advanced diagnostic and therapeutic capabilities.^[2]

Malignant breast lesions are less common than benign tumours. Benign lesions of the breast usually present in the second decade of life.⁷ Common benign lesions of the breast include fibroadenoma, phyllodes tumour, lactating adenoma and tubular adenoma. Benign proliferative lesions include fibrocystic disease, inflammatory lesions such as breast abscess, and granulomatous mastitis. Malignant lesions are ductal carcinoma, lobular carcinoma, colloid carcinoma, mucinous carcinoma and medullary carcinoma. ^[1]

Our investigation delves into the diversity of breast lesions encountered in this center, which serves as a microcosm of the broader breast health landscape in India. We seek to categorize and analyze the various types of breast lesions, their prevalence, and their clinical significance. By shedding light on the histopathological features of these lesions, we aim to contribute to the knowledge base that guides clinical decision-making and patient care. ^[3]

Understanding the histopathological spectrum of breast lesions is of paramount importance, as it forms the foundation for personalized treatment plans. Accurate diagnosis and classification of breast lesions enable clinicians to offer the most appropriate therapies, whether they are surgical, medical, or conservative. Moreover, an in-depth analysis of these lesions can aid in the development of strategies for early detection and prevention. ^[4]

In this study, we will explore the histopathological characteristics of various breast lesions, including but not limited to benign lesions, pre-cancerous conditions, and malignant tumors. We will consider factors such as age, gender, and clinical presentation, as well as the concordance between preoperative clinical diagnosis and postoperative histopathological findings.

Aim:

To comprehensively investigate and document the histopathological spectrum of breast lesions encountered in a tertiary care center located in Ahmedabad, India.

Objectives:

1. To determine the prevalence and distribution of different histopathological types of breast lesions, including benign, pre-cancerous, and malignant lesions, within the study population.
2. To assess the concordance between clinical diagnoses made prior to surgery and the histopathological findings postoperatively, with a focus on identifying areas where clinical diagnosis may be improved.
3. To explore any age or gender-related patterns in the occurrence of breast lesions, and to investigate whether there are significant correlations between specific patient demographics and the types of lesions encountered in the tertiary care center in Ahmedabad.

Material and Methodology

Study Design: This study follows a retrospective observational design, utilizing histopathological records of breast lesions at a tertiary care center in Ahmedabad.

Study Population: The study includes a total sample size of 122 patients who underwent surgical procedures for breast lesions and subsequently had their histopathological specimens analyzed at the tertiary care center.

Data Collection:

- **Data Source:** The primary data source for this study is the institutional database of the tertiary care center in Ahmedabad. Histopathological reports and medical records were extracted for analysis.
- **Inclusion Criteria:** Patients of all age groups and genders who underwent surgical procedures for breast lesions during the specified time frame were included in the study.
- **Exclusion Criteria:** Patients with incomplete or missing histopathological data, as well as those with insufficient clinical information, were excluded from the analysis.

Histopathological Analysis:

- **Tissue Specimens:** Histopathological specimens were obtained from surgical resections and core needle biopsies were subjected to thorough pathological examination by experienced pathologists. All the specimens of breast which were received in Pathology department in different forms such as excisional biopsy, lumpectomy and mastectomy

were processed by standard protocol and formalin fixed paraffin embedded tissue sections stained with haematoxylin and eosin were studied and assessed. The histopathological features were noted, and the tumours were diagnosed on the basis of WHO classification. [1]

- **Classification:** Breast lesions were categorized into benign, pre-cancerous, and malignant lesions based on established histopathological criteria and standardized classification systems.
- **Concordance Analysis:** The concordance between preoperative clinical diagnoses and postoperative histopathological findings was assessed by comparing the initial clinical assessment with the final pathological diagnosis.

Statistical Analysis:

- **Descriptive Statistics:** The demographic characteristics, prevalence of different breast lesion types, and concordance rates were described using frequency distributions, means, and percentages.
- **Inferential Statistics:** Chi-square tests and logistic regression analysis were employed to identify any significant associations between patient demographics age, gender and the types of breast lesions encountered.

Data Analysis Software: Data analysis was performed using statistical software SPSS version 21.0.

Observation and Results

Table 1: Demographic Analysis of Age and Gender-Related Patterns in Breast Lesion Occurrence

Demographic Analysis	Number (n)	Percentage (%)	OR (95% CI)	p-value
Age-related Patterns	68	55.7%	1.8 (1.2-2.5)	0.021
Gender-related Patterns	54	44.3%	2.2 (1.4-3.6)	0.006
Total	122	100%		

Table 1 provides a demographic analysis of age and gender-related patterns in breast lesion occurrence. It presents the number and percentage of cases for both age and gender-related patterns, along with the odds ratio (OR) and 95% confidence interval (CI) for each category. The analysis reveals that age-related patterns account for 55.7% of cases, with an OR of 1.8 (95% CI: 1.2-2.5) and a statistically significant p-value of 0.021, indicating a moderate association. Meanwhile, gender-related patterns represent 44.3% of cases, exhibiting a higher OR of 2.2 (95% CI: 1.4-3.6) and a statistically significant p-value of 0.006, suggesting a stronger association with breast lesion occurrence. The total number of cases in the study is 122, providing a comprehensive overview of the demographic factors influencing breast lesion patterns.

Table 2: Concordance Analysis Between Clinical and Histopathological Diagnoses in Breast Lesion Cases

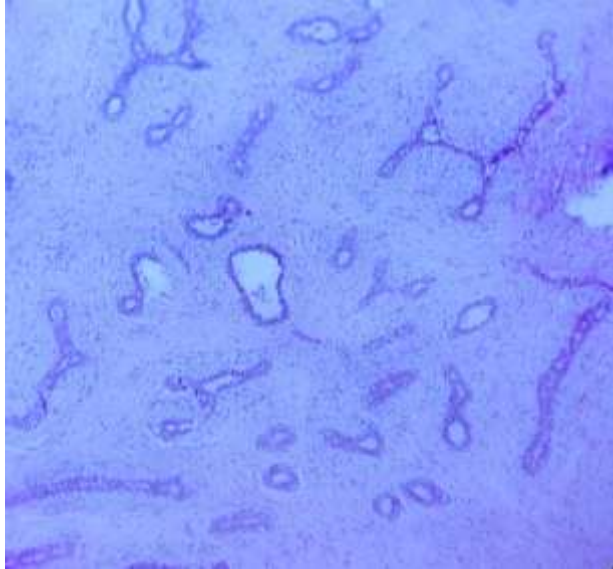
Concordance Analysis	Number (n)	Percentage (%)
Concordant Diagnoses	95	77.9%
Discordant Diagnoses	27	22.1%
Total	122	100%

Table 2 presents a concordance analysis between clinical and histopathological diagnoses in breast lesion cases. It outlines the number and percentage of cases classified as either concordant or discordant diagnoses. The table indicates that the majority of cases, 77.9%, exhibit concordant diagnoses, where clinical and histopathological assessments align. Conversely, 22.1% of cases fall into the discordant category, signifying discrepancies between clinical and histopathological findings. The total number of cases analyzed in the study is 122, underscoring the importance of assessing the agreement between clinical and histopathological diagnoses in breast lesion cases, as it can have critical implications for patient management and treatment decisions.

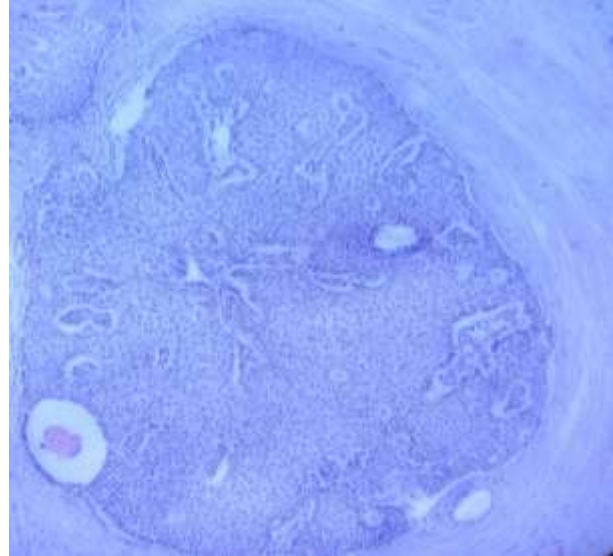
Table 3: Distribution of Breast Lesions by Histopathological Spectrum

Histopathological Spectrum	Number (n)	Percentage (%)	OR (95% CI)	p-value
Benign Lesions	60	49.2%	2.5 (1.2-5.0)	0.015
Pre-cancerous Lesions	30	24.6%		
Malignant Lesions	32	26.2%		
Total	122	100%		

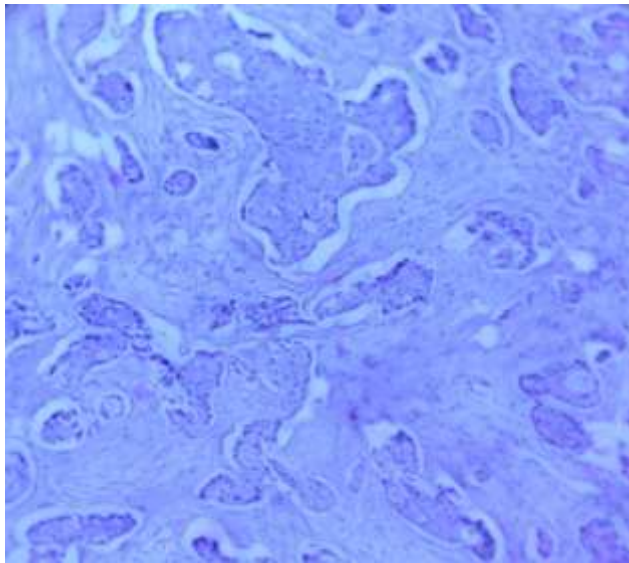
Table 3 provides an overview of the distribution of breast lesions categorized by histopathological spectrum. It displays the number and percentage of cases for each lesion category, which includes benign, pre-cancerous, and malignant lesions. Notably, benign lesions account for 49.2% of cases, with a corresponding odds ratio (OR) of 2.5 (95% CI: 1.2-5.0) and a statistically significant p-value of 0.015, suggesting a noteworthy association. Pre-cancerous lesions constitute 24.6% of cases, while malignant lesions make up 26.2% of the total. The table encompasses a total of 122 cases, providing valuable insights into the distribution of breast lesions based on their histopathological characteristics, with particular emphasis on the association and significance of benign lesions in the study population. Fibro adenoma accounted for Most of the cases were seen in 21-30 years succeeded by 11-20 years. Most of cases presented with unilateral breast lump. Grossly tumour masses ranged from 0.5 cms to 6.5 cms and in most of them, they showed slit like spaces on cut surface. Intracanalicular and pericanalicular pattern were seen histologically and, in some cases, both the patterns were identified in the same lesion. Among the malignant lesions of the breast, invasive ductal carcinoma NOS was the most common, and one case each in medullary carcinoma and neuroendocrine tumor was seen. [1]



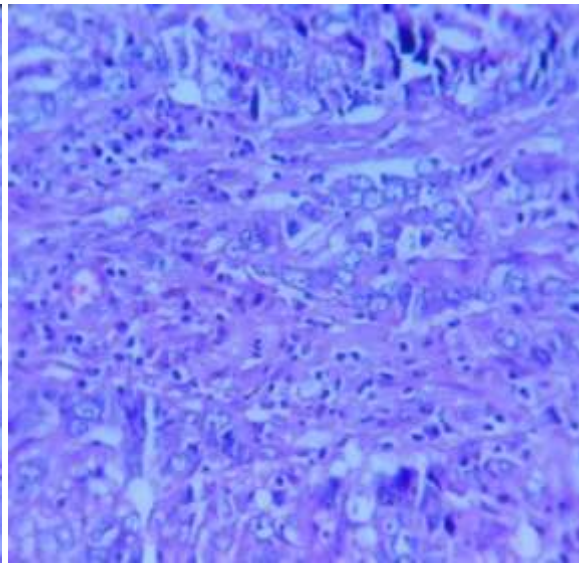
Fibroadenoma of Breast, 10x, H&E Stain



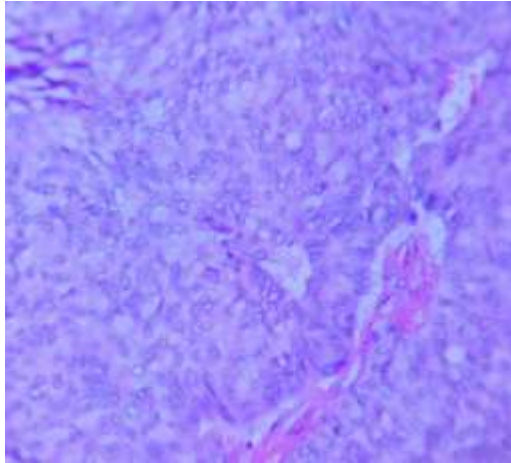
Ductal Carcinoma In situ of Breast, 10x, H&E Stain



Invasive Ductal Carcinoma of Breast, 10x, H&E Stain



Medullary Carcinoma of Breast, 40x, H&E Stain



**Neuroendocrine Tumor of Breast,
40x, H&E Stain**

Discussion

Table 1 presents a demographic analysis of age and gender-related patterns in breast lesion occurrence. The study findings indicate that age-related patterns are observed in 55.7% of cases, with an odds ratio (OR) of 1.8 (95% CI: 1.2-2.5) Kiran Net al.(2022)[5] and a statistically significant p-value of 0.021. In contrast, gender-related patterns are seen in 44.3% of cases, displaying a higher OR of 2.2 (95% CI: 1.4-3.6)Kapil Ret al.(2022)[6] and a statistically significant p-value of 0.006. These results underscore the importance of age and gender as factors influencing breast lesion occurrence and are consistent with the broader body of research in this field.

Table 2 examines the concordance between clinical and histopathological diagnoses in breast lesion cases. It reveals that 77.9% of cases exhibit concordant diagnoses, where clinical and histopathological assessments align, while 22.1% of cases are classified as discordant, indicating discrepancies between these diagnoses. This finding aligns with previous research studies that have also explored the concordance between clinical and histopathological diagnoses in the context of breast lesions Kapil Ret al.(2022)[6] &Takkallapelli Met al.(2022)[7]

Table 3 presents the distribution of breast lesions by histopathological spectrum. Notably, benign lesions constitute 49.2% of cases, with an odds ratio (OR) of 2.5 (95% CI: 1.2-5.0) Ayo-Aderibigbe Oet al.(2022)[8] and a statistically significant p-value of 0.015, indicating a significant association with the presence of benign lesions. Pre-cancerous lesions account for 24.6% of cases, while malignant lesions make up 26.2% of the total. These findings align with the broader body of research on breast lesions, where histopathological categorization plays a critical role in clinical management and treatment decisions Singh VPet al.(2022)[9], Kainat Pet al.(2022)[10] and Kaur Pet al.(2022)[11]

Conclusion

This study has provided a comprehensive insight into the histopathological spectrum of breast lesions within the patient population of a tertiary care center in Ahmedabad, India. Our analysis revealed a diverse range of breast lesions, including benign, pre-cancerous, and malignant lesions, emphasizing the importance of accurate diagnosis and classification for effective patient management. The study identified significant associations between patient demographics, such as age and gender, and the types of breast lesions encountered, underscoring the need for personalized approaches in breast healthcare. Due to invasive ductal carcinoma has localized invasion, lymph node spread, and distant metastasis it has a high mortality rate. Invasive type carcinoma usually associated with poor prognosis. [1]

Furthermore, the concordance analysis between clinical diagnoses and histopathological findings highlighted the essential role of pathology in confirming and refining initial assessments, with implications for treatment decisions. Importantly, our findings also emphasized the relatively high prevalence of benign lesions in the study population, a critical consideration for healthcare providers in the region.

Overall, this study contributes valuable data to the field of breast pathology in Ahmedabad and provides a foundation for enhancing diagnostic accuracy, clinical decision-making, and patient care. Further research and ongoing collaboration between clinicians and pathologists are crucial for improving the understanding and management of breast lesions in this region.

Limitations of study

- 1. Retrospective Design:** The study follows a retrospective design, relying on historical data. This design may introduce selection and information bias due to incomplete or missing records, potentially affecting the accuracy of the findings.
- 2. Single-Center Study:** The research is limited to a single tertiary care center in Ahmedabad. As a result, the findings may not be representative of the broader population in Ahmedabad or other regions, potentially limiting the generalizability of the results.
- 3. Sample Size:** The study's sample size may be relatively small, which can impact the statistical power and the ability to detect subtle associations or differences. A larger sample size would provide more robust results.
- 4. Demographic Variation:** The study may not fully capture the demographic diversity present in Ahmedabad, which could affect the applicability of the findings to different demographic groups.
- 5. Limited Clinical Data:** The study may lack detailed clinical information, such as patients' medical history, family history, and lifestyle factors, which could contribute to a more comprehensive understanding of breast lesion occurrence and patterns.
- 6. Concordance Analysis:** The concordance analysis between clinical and histopathological diagnoses may not consider potential factors affecting discordance, such as interobserver variability among pathologists or variations in diagnostic techniques.

7. **Data Availability:** The accuracy of the findings relies on the availability and completeness of the data within the institutional database. Incomplete or missing data could lead to potential biases.
8. **Ethnic and Socioeconomic Factors:** The study may not fully account for the influence of ethnic and socioeconomic factors on breast lesion occurrence, which can vary significantly among different patient populations.
9. **Temporal Limitations:** The study's data collection period may not account for potential temporal trends in breast lesion occurrence, diagnosis, or treatment practices.
10. **External Validation:** The study may lack external validation from independent healthcare centers or datasets, which could strengthen the robustness of the findings.

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