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Original Research Article

A Study of Spectrum of Non-Malignant Breast Lesions: Insights from Histopathological Evaluation in a Tertiary Care Hospital, Hyderabad

Arfathunnisa Mohammad[1], Keerthana Muppidi[2], Nabila Afsar[3]

[1]Assistant Professor, Department of Pathology, CMR Institute of Medical Sciences and Hospital, Hyderabad, Telangana, India

[2]Associate Professor, Department of Pathology, CMR Institute of Medical Sciences and Hospital, Hyderabad, Telangana, India

[3]Professor & HOD, Department of Pathology, CMR Institute of Medical Sciences and Hospital, Hyderabad, Telangana, India

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Corresponding Author: Dr. Keerthana Muppidi

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Abstract:

Background: Breast lesions constitute a heterogeneous group of conditions, with non-malignant lesions forming the majority of breast specimens encountered in routine clinical practice. Despite advances in imaging techniques, significant overlap exists between benign and malignant breast lesions, making histopathological examination essential for definitive diagnosis. This study was undertaken to evaluate the spectrum, age distribution, and histopathological patterns of non-malignant breast lesions.

Methods: This retrospective descriptive study was conducted from October 2023 to October 2025. A total of 89 breast specimens with histopathologically confirmed non-malignant lesions were included. Lesions were classified based on established histopathological criteria, and relevant clinical and demographic data were recorded. Descriptive statistical analysis was performed to assess lesion distribution, age and gender patterns, and clinico-pathological correlation.

Results: Among the 89 non-malignant breast lesions analyzed, fibroadenoma was the most common lesion (62.9%), followed by gynecomastia (7.9%), benign phyllodes tumor(5.6%), and inflammatory breast diseases (5.6%). The age of patients ranged from 12 to 58 years, with a mean age of 29.5 years. Females constituted 92.1% of cases, with a slight predominance of left-sided lesions. Breast lump was the most common presenting complaint, and the most frequent lump size was 2.1–4.0cm. Clinico-histopathological concordance was observed in 78.6% of cases.

Conclusion: Non-malignant breast lesions were predominantly fibroadenomas occurring in young women, emphasizing the benign nature of most breast lumps in this population. Histopathological examination remains the gold standard for accurate diagnosis, particularly in cases with clinical ambiguity. While most patients can be reassured following confirmation of benign pathology, identification of atypical or phyllodes lesions is crucial for appropriate surgical management.

Keywords: Fibroadenoma; Non-Malignant Breast Lesions; Histopathology; Clinico-Pathological Correlation.

Introduction

Breast disease represents a major global public health challenge. Breast cancer is the most common malignancy among women worldwide, with an estimated 2.3 million new cases and 685,000 deaths in 2020. WHO and GLOBOCAN data indicate increasing incidence rates, especially in low- and middle-income countries, driven by reproductive, lifestyle, and environmental changes.

However, not all breast lesions are malignant: benign and non-malignant lesions are far more common. Knowledge of their distribution, clinical behavior, and pathological types is essential for appropriate diagnosis, management, and to avoid overtreatment.

In the Indian context, breast cancer incidence has also been rising, and it is now the most common cancer among women in India. At the same time, histopathological studies from different regions of India consistently report a predominance of non-malignant breast lesions. For example, in a recent study, benign lesions formed about 58.8% of breast cases, malignant 19.6%, with the rest inflammatory. Another Indian series found nearly 80% benign and 20% malignant lesions. A large hospital-based study in Mumbai documented that 68% of breast lesions

were benign, while another study from Andhra Pradesh reported fibroadenoma as the most frequent lesion, particularly in the 21–30 year age group. Similarly, in South India, fibroepithelial lesions comprised a significant subset, with fibroadenomas accounting for 95% of cases.

Despite advances in imaging modalities such as mammography and ultrasonography, clinical and radiological features often overlap between benign and malignant conditions. For instance, features such as lump size, consistency, or nipple discharge may mimic malignancy, while radiological findings may raise suspicion in otherwise benign lesions. Histopathological examination therefore remains the gold standard for establishing a definitive diagnosis.

In Hyderabad, as in many other Indian urban centers, tertiary care hospitals encounter a wide range of breast conditions across diverse socio-economic strata. However, there is limited published literature on the spectrum of non-malignant breast lesions from this region in recent years. Understanding the local patterns-types of lesions, age distribution, and clinico-pathological correlation-will help clinicians in diagnosis, management, and counseling, as well as strengthen regional data on breast pathology.

Therefore, this study was undertaken to evaluate the spectrum of non-malignant breast lesions in a tertiary care hospital in Hyderabad using histopathological methods.

Aims and Objectives

- To study the spectrum of non-malignant breast lesions using histopathological evaluation.
- To classify the different types of non-malignant breast lesions.
- To analyze the age distribution and gender of patients with non-malignant breast lesions.
- To correlate clinical presentation with histopathological findings.
- To highlight the histopathological patterns of non-malignant breast lesions.

Materials and Methodology

The current Retrospective descriptive study was conducted in the Department of Pathology, CMR institute of medical sciences and hospital, Hyderabad from October 2023 to October 2025 on 89 cases of non-malignant breast lesions confirmed on histopathology. Institutional

Study Population: All patients who underwent breast specimen evaluation (biopsy, excision) in the hospital during the study period and whose diagnosis is one of the non-malignant breast lesions on histopathology.

Ethical Considerations: Institutional Ethics Committee approval is obtained prior to commencement of the study. Patient confidentiality and anonymity is maintained throughout the research process.

Inclusion Criteria

- Breast tissue specimens (biopsy or excision) with histopathological diagnosis of non-malignant / benign breast lesions.
- Adequate sample for histopathological evaluation.
- All age groups and both sexes.

Exclusion Criteria

- Specimens diagnosed as malignant breast lesions.
- Specimens deemed inadequate for reliable histopathological assessment.
- Repeat specimens or recurrences of malignant lesions.

Histopathological Methods: All specimens were handled according to standard pathology grossing protocols. Tissue samples were fixed in 10% buffered formalin, processed routinely, and embedded in paraffin wax. Sections were cut at 4–5 µm thickness and stained with Hematoxylin and Eosin (H&E) for routine histopathological examination. Each case was evaluated microscopically, and lesions were classified according to established histopathological criteria.

Data Collection: Demographic information including age and sex, clinical details such as presenting complaints, duration, laterality, and imaging findings (if available) are collected. Histopathological data regarding type and microscopic features of each lesion are taken.

Data Analysis: The collected data is entered and analyzed using Microsoft Excel or SPSS software. Descriptive statistics are used to summarize the data, including frequencies, percentages, means with standard deviation, or medians with interquartile range as applicable. Age distribution is stratified by decades to determine common age groups affected by non-malignant breast lesions. Correlation between clinical presentation and histopathological diagnosis is assessed using cross-tabulation.

Results

During last two years from October 2023 through October 2025, a total number of 89 cases of Non-malignant breast lesions have been received as shown in Table number 1. Out of these, Fibroadenoma is found to be the commonest one (56 cases, 62.92 %) followed by Gynaecomastia in frequency (7 cases, 7.87%).

Table 1: Depicted entire spectrum and frequency of occurrence of various benign breast lesions on histopathological basis

Sl. No.	Lesion (Histopathological Diagnosis)			Total No. of Cases	Percentage
1	Fibroadenoma	Fibroadenoma (NOS)	44	56	62.92
		Fibroadenoma with fibrocystic change	5		
		Fibroadenoma with ductal hyperplasia	6		
		Juvenile fibroadenoma	1		
2	Fibrocystic disease			3	3.37
3	Gynecomastia			7	7.87
4	Benign phyllodes			5	5.62
5	Borderline phyllodes			3	3.37
6	Intraductal papilloma			2	2.25
7	Fibroadenosis			3	3.37
8	Inflammatory breast diseases	Acute Mastitis	3	5	5.62
		Chronic mastitis	1		
		Granulomatous mastitis	1		
9	Lactating adenoma			1	1.12
10	Atypical ductal hyperplasia			2	2.25
11	Microglandular adenosis			1	1.12
12	Tubular adenoma			1	1.12
	Total			89 cases	100%

Fibroadenoma was predominantly seen in patients aged 16 to 50 years, with a mean age of 27.2 years. The youngest patient was 16 years old and the oldest was 50years with having diagnosis of fibroadenoma.

Gynecomastia was the next most common benign lesion, comprising 7.87% of the cases. The patients' ages ranged from 12 to 50 years, with a mean age of approximately 24.1 years. Presenting complains of patients were mostly lump alone followed by Lump with pain.

Table 2: Agewise distribution of Non-malignant breast lesions

Age Group (yrs)	Count	Percentage
0-19	22	24.72
20-29	25	28.09
30-39	26	29.21
40-49	7	7.87
50-59	9	10.11
Total	89	100

Out of 89 cases of non-malignant breast lesions, 47(52.81%) patients had a left sided lesion and 42(47.19%) right sided lesions.

Out of 89 cases, only 7 cases are male (7.87%) and rest of 82 cases are females (92.13%).

The age distribution of the patients is shown in [Table 2]. The age of patients with non-malignant breast lesions ranged from 12 to 58 years, with a mean age of 29.5 years.

The majority of cases (26 patients; 29.2%) were in the 30–39 year age group. The youngest patient was a 12-year-old boy who presented with gynecomastia, while the youngest female was 16 years old, presenting with a small lump in the right breast. The oldest patient was a 58-year-old woman with a lump in the left breast.

The most frequent lump size observed was 2.1–4.0 cm, seen in 43 cases (48.3%), making it the commonest size group in the series. The mean size of most common lesion in our study, fibroadenoma is 3.42cm as shown in table number 3 and mean age is 27.2 as shown in table number 4.

Table 3: Detailed Size Distribution by Lesion Type

Lesion Type	n	Mean Size (cm)	SD	Min	Max
Fibroadenoma	56	3.42	1.68	1.5	11.7
Fibrocystic Disease	3	3.33	0.58	3.0	4.0
Gynecomastia	7	5.07	2.09	3.0	9.0
Benign Phyllodes	5	4.7	2.05	2.5	8.0
Borderline Phyllodes	3	6.67	2.52	4.0	9.0
Intraductal Papilloma	2	4.5	0.71	4.0	5.0
Fibroadenosis	3	2.03	0.06	2.0	2.1
Inflammatory Breast Diseases	5	2.56	1.99	1.0	5.8
Lactating Adenoma	1	2.0		2.0	2.0
Atypical Ductal Hyperplasia	2	3.25	0.35	3.0	3.5
Microglandular Adenosis	1	3.0		3.0	3.0
Tubular Adenoma	1	6.6		6.6	6.6
Total	89				

Table 4: Mean Age Distribution by Lesion Type

Lesion Type	n	Mean Age (yrs)	SD	Min	Max
Fibroadenoma	56	27.2	8.8	16	50
Fibrocystic Disease	3	33.3	14.6	18	47
Gynecomastia	7	24.1	12.1	12	50
Benign Phyllodes	5	33.6	7.3	21	40
Borderline Phyllodes	3	55.3	4.6	50	58
Intraductal Papilloma	2	43.5	19.1	30	57
Fibroadenosis	3	33.3	8.3	24	40
Inflammatory Breast Diseases	5	36.4	16.2	19	57
Lactating Adenoma	1	19.0		19	19
Atypical Ductal Hyperplasia	2	39.0	19.8	25	53
Microglandular Adenosis	1	16.0		16	16
Tubular Adenoma	1	19.0		19	19
Total	89				

Table 5: Concordance between Clinical and Histopathological Diagnosis

Lesion Type	Total Cases (n)	Concordant (n)	Discordant (n)	Concordance Rate (%)
Fibroadenoma	73	56	17	76.7
Fibrocystic Disease	1	0	1	0.0
Gynecomastia	7	7	0	100.0
Fibroadenoma/Phyllodes Tumor	1	0	1	
Phyllodes	2	2	0	100
Intraductal Papilloma	0	0	0	
Fibroadenosis	0	0	0	
Mastitis / Abscess	5	5	0	100.0
Lactating / Tubular / Adenoma	0	0	0	
Atypical Ductal Hyperplasia	0	0	0	
Microglandular Adenosis	0	0	0	
Total	89	70	19	78.6

Out of the 89 cases of non-malignant breast lesions, 70 cases (78.6%) correlated well with histopathology as shown in table number 5. Clinical misdiagnosis as fibroadenoma occurred in 18 cases. Histopathologically these cases were diagnosed as benign phyllodes, intraductal papilloma, lactating adenoma, atypical ductal hyperplasia, fibrocystic breast disease, fibroadenosis, borderline phyllodes, microglandular adenosis and tubular adenoma. One case clinically misdiagnosed as fibrocystic disease, later turned out to be intraductal papilloma on histopathology. In these cases, histopathology was the gold standard for diagnosis.

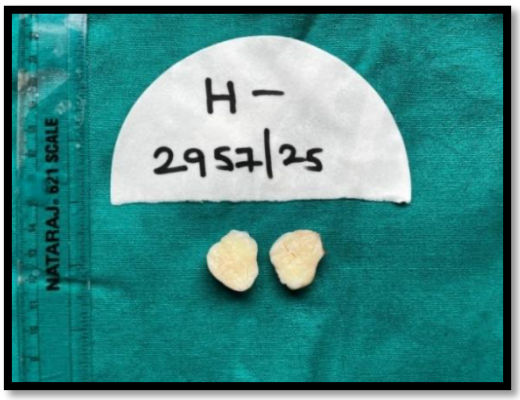

Figure 1: Cut section of fibroadenoma showing glistening surface with slit like spaces

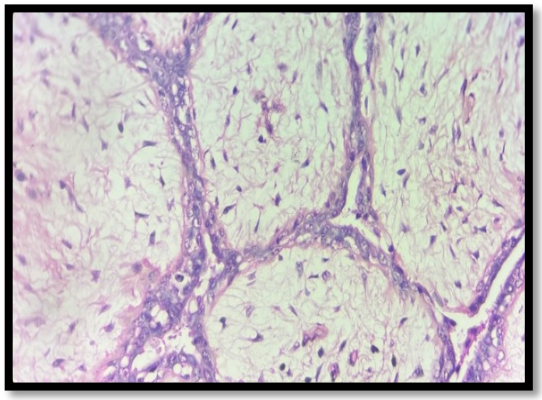

Figure 2: Fibroadenoma with intracanalicular growth pattern. (H &E, 100X)

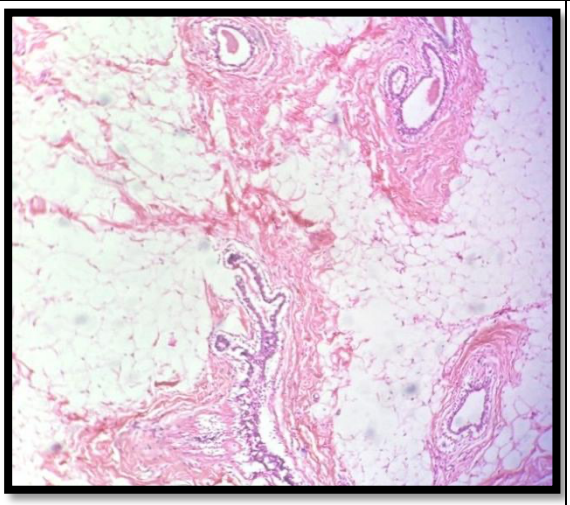

Figure 3: Gynecomastia of male breast showing ducts within loose stroma. (H &E, 10X.)

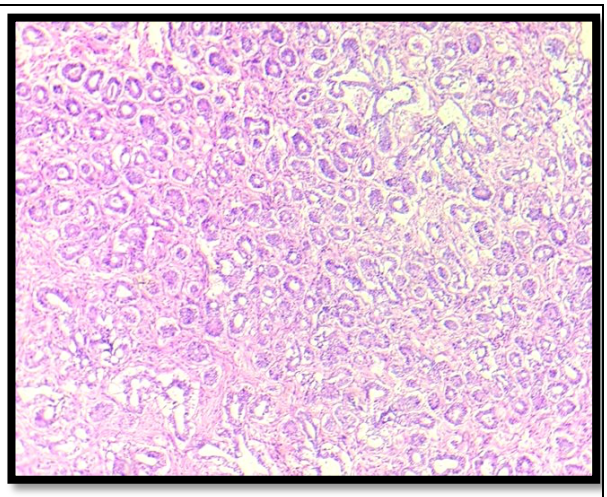

Figure 4: Tubular adenoma showing nodule composed of well-formed tubules lined by epithelial and myoepithelial cells. (H &E, 100X)

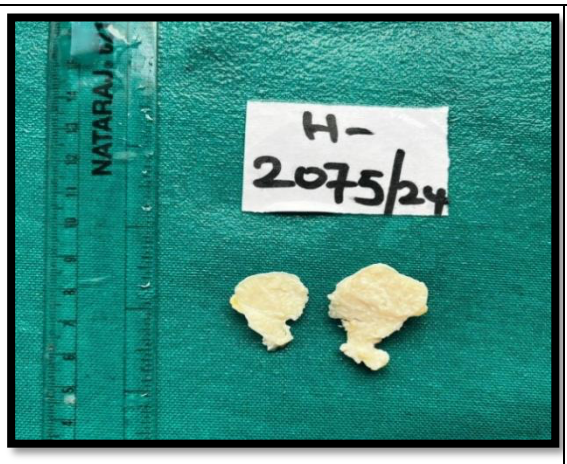

Figure 5: Shows cut section of benign Phyllodes tumor

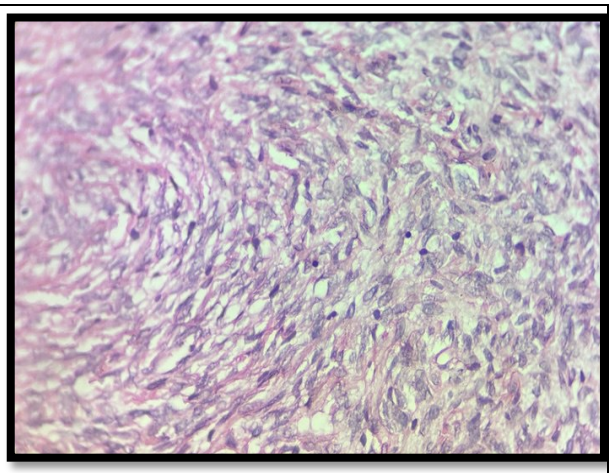

Figure 6: Picture showing phyllodes with predominant stromal component. (H&E, 10X)

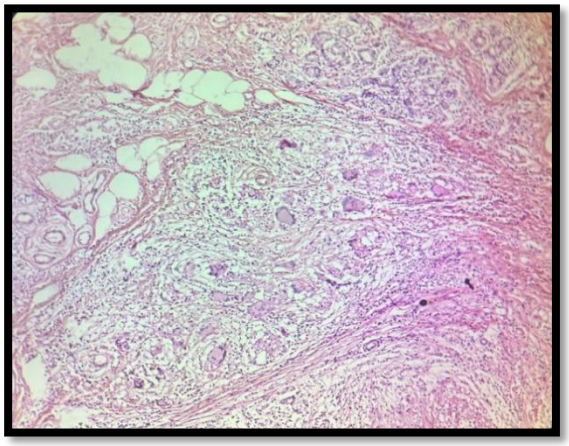

Figure 7: Picture showing lobulocentric granulomatous inflammation of breast-Granulomatous mastitis. (H & E, 4X.)

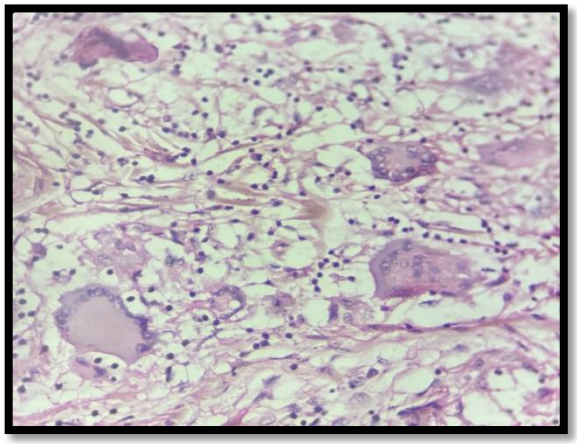

Figure 8: Picture showing granulomatous inflammation of breast-Granulomatous mastitis. (H & E, 40X.)

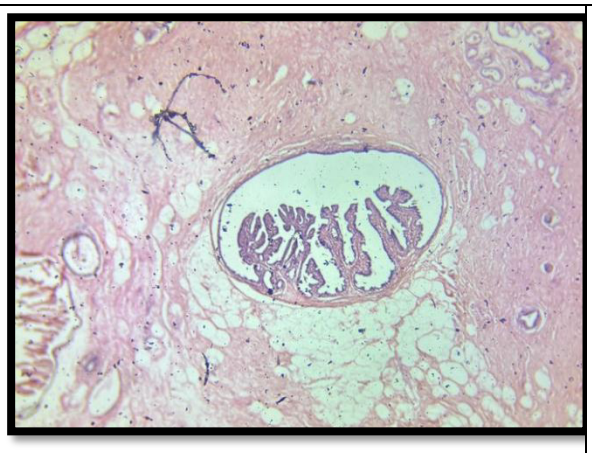

Figure 9: Picture showing breast duct with intraductal papilloma (H & E,4X)

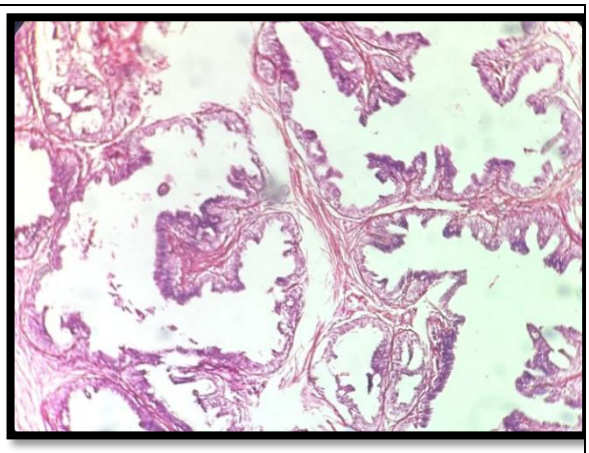

Figure 10: Picture showing intraductal papilloma with central fibrovascular core lined by luminal and myoepithelial cells. (H & E, 40X)

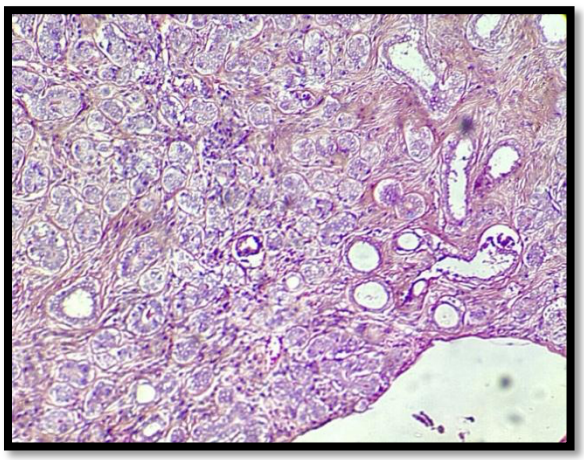

Figure 11: Picture showing haphazard proliferation of small round glands with open lumina composed of single layer of epithelial cells-Microglandular adenosis. (H & E, 4X.)

Discussion

A 200,000 breast disorders are identified annually, and it is stated that most of the palpable lesions are non-malignant.[1] Non-malignant breast lesion affects women of a large age range from puberty to postmenopause and are important because they mimic malignancy.

Because of its high prevalance and their ability to affect women's life our focus on non-malignant pathology is justified.

Total 89 cases have been included in our present study (from October 2023 to October 2025), out of them 82 patients (92.13%) are female & 7 patients (7.87%) are male.

In a similar study done by Kulkarni Sangeeta et al,[2] out of 176 cases, 171 were females (97.16%) and five were males (2.84%). In a study done by Malik et al,[3] 94.52% patients were females & 5.48% patients were males. In a study done by Pudale S et al,[4] 97.78% patients were females & 2.22% patients were males so, female: male ratio or gender ratio remains more or less similar in all studies.

Our study confirms that fibroadenoma is by far the most common entity. We found fibroadenomas in 62.92% of cases, our results largely mirror other Indian data. Majority of them showed slit like areas on cut surface as shown in figure 1. Intracanalicular and pericanalicular pattern were seen microscopically as shown in figure 2, and in some both patterns coexisted in the same tumour.

In a study done by Kulkarni Sangeeta et al,[2] fibroadenomas constitute 62.32% of benign cases, and Khanna et al,[5] reported 72%. Similar observation made by Vilasini Patil et al,[6] 65.7%, Dayanand et al,[7] 62.3%, Poojasree et al[8] (54.2%) and Haqque et al,[9] (52.88%) as cited in table number 6.

Majority of fibroadenoma patients seen in 30-39 years (35.71%) followed by 20-29 years (28.57%) of age group in present study. Kumar et al[10] noted 74.03% cases in 11-30 years while Prajapathi et al [11] noted 80.64% of cases in 21-30 years.

In our study we noted 51.7% cases of fibroadenoma in left breast, 48.3% cases in right breast. Bagale et al [12] noted 95% cases in left breast and rest were detected in both breasts.

The size of the lump of fibroadenoma in the present study ranged from 1.5 -11.7cm. This finding was similar to study done by Boral and Jagtap,[13] who reported the lump size of fibroadenoma to be 1 to 13cm and Al Atrooshi et al,[14] ranged from 1.5 - 19cm.

Table 6: Comparision of histopathological spectrum of Non-malignant breast lesions with other studies

Sl. No.	Non-Malignant Breast Lesions	Kulkarni Sangeeta et al [2]	Hatim et al [15]	Poojasree et al [8]	Haqque et al [9]	Vilasini patil et al [6]	Dayanand et al [7]	Present study
1	Fibroadenoma	62.32	77.6	54.2	52.88	65.7	62.3	62.92
2	Fibrocystic disease	11.59	4.3	-	22.12	10	16.2	3.37
3	Gynecomastia	-	4.3	-	-	6.25	-	7.87
4	Benign phyllodes	-	3.4	-	-	5.6	7.6	5.62
5	Fibroadenosis	-	-	17.8	-	-	-	3.37
6	Inflammatory breast diseases	5.80	2.4	-	9.62	1.87	-	5.62
7	Lactating adenoma	-	-	-	-	2.5	-	1.12
8	Atypical ductal hyperplasia	-	-	-	-	-	-	2.25
9	Microglandular adenosis	-	-	-	-	-	-	1.12
10	Tubular adenoma	-	0.4	-	-	0.63	-	1.12

Out of 89 cases, Gynecomastia was the next common condition in our study constituting 7.87% of cases, majority belonged to 20-29 (3rd decade) years, with right breast involvement in 57.14% cases. This is correlated with Hatim KS et al[15] study, in which both gynecomastia and fibrocystic disease were the next common cases constitute 4.3% each of Non-malignant breast lesions as cited in table number 6. Most of the gynecomastia cases (66.6%) where seen in 3rd decade. Karki et al [16] noted 4% cases of gynecomastia whereas Vilasini Patil et al,[6] 6.25% of cases. Microscopically, the ducts seen within the hyalinised stroma as shown in figure 3.

Few studies showed fibrocystic disease as the next common lesion like Vilasini Patil et al [6] 10% whereas Pudale et al [4] 32.7%. Our study constitutes only 3.37% cases of fibrocystic disease belonged to 18- 49 years, with left breast involvement in 66.67% cases. Prajapathi et al,[11] noted most of the cases in 4th decade while Sangma et al [17] noted most of the cases in 3rd and 4th decades.

In our present study, majority of cases belong to 30-39 yrs age group (4th decade of life) followed by 20-29yrs (3rd decade of life). This finding is concurrent with studies done by Tonape, Pandey et al, and Tiwari P and Tiwari M. [18-20] This predilection for the fourth decade differentiates Non-malignant

breast lesions from malignancies. The incidence of Non-malignant breast lesion begins to rise in the second decade of life and peaks in the fourth or fifth decades, whereas the incidence of malignant lesions continues to rise after menopause.[17]

Certain non-malignant lesions like Gynecomastia, Breast Abscess, etc. can occur in any age group and show no definite association with patient's age, while few lesions like Tubular Adenoma, Lactating Adenoma, Benign Phyllods Tumor, Fibrocystic Disease, etc. have some association with patient's age.

Tubular Adenomas are pure epithelial adenomas seen at somewhat younger age as compared to other non-malignant lesions and uncommon after 3rd decade of life. In our present study, we have included 1 case (1.12%) of Tubular Adenoma belong to age group of 0-19 years (2nd decade). Other studies like those done by Pudale et al,[4] showed 0.55% of cases and were commonly seen in 11-30 years. The microscopic examination showed small uniform closely packed round tubles lined by inner luminal epithelial cells and outer myoepithelial cells as shown in figure 4.

Benign Phyllods Tumor (5.62%) majority of patients were between 30-39 years (fourth decade of life) which is similar to the study done by Mudholkar et al [21] and Mallikarjuna et al. [22] Pudale et al [4] noted most of the cases in 5th decade. Left breast involvement was seen in 80% cases while rest in right breast in the present study. Sagar et al,[23] noted 60% in left breast and 40% in right breast. Cutsection of phyllodes tumor shown in the figure 5 and microscopically phyllodes tumor showed leaf like epithelial pattern with stromal hyperplasia as seen in figure 6.

Inflammatory breast diseases accounted for 5.62% of all Non-malignant breast lesions in our present study. 4 cases of mastitis noted mostly in 6th decade (50%).

We noted one case of granulomatous mastitis in the age group 20-29 years and granulomas seen confined to the lobule as shown in figure 7.

Lactating Adenomas are usually common during reproductive period of life and seen during 21-30 years commonly. Clinical History of Pregnancy and Lactation is necessary in these cases to give the final diagnosis. Our present study includes 1 case (1.12%) while Pudale et al [4] showed 1.67% of cases.

We noted 2.25% of intraductal papilloma in our study while Bagale et al [12] noted 2.24% cases of intraductal papilloma and the cases were in the age group of 30-59 years. The microscopic examination showed intraductal proliferation of epithelial cells with fibrovascular cores and underlying myoepithelial cells as shown in figure 8 and 9.

One case of microglandular adenosis (1.12%) was reported in a 16 years female in our study. The microscopic examination showed haphazard proliferation of small round glands with open lumina composed of single layer of epithelial cells as shown in figure 10.

We found a 78.6% agreement between the preoperative (clinical) diagnosis and final histopathology. This high concordance accords with other studies: Boral and Jagtap [13] documented 73% clinicopathologic correlation in Non-malignant breast lesion. In general, common lesions (fibroadenomas, gynaecomastia, mastitis) are often correctly suspected by clinicians, whereas unusual or overlapping cases may be misjudged.

The high overall concordance suggests that history and imaging are usually reliable, but we reaffirm that histology is the gold standard. As some studies emphasize, fine-needle or core biopsy adds confidence, but any persistent lump should ultimately be excised to be certain.

Strengths and Limitations: The major strength of our study is that all cases were histopathologically confirmed, yielding a definitive spectrum of lesions. We also collected data prospectively over two years in a tertiary hospital, giving a realistic clinical case-mix. On the other hand, limitations include the relatively small sample (89 cases) and single-center scope, which may limit generalizability.

Conclusions

In summary, Non-malignant breast lesions in our Hyderabad cohort are overwhelmingly dominated by fibroadenomas in young women. This finding reinforces prior reports and underscores the benign nature of most breast lumps in this age group. Gynecomastia remains the most common male lesion, reflecting hormonal physiology. Clinical diagnoses were usually accurate (≈79% concordance), but vigilance is needed for fibroepithelial ambiguities. The practical implication is that most patients with breast lumps can be reassured when pathology confirms a benign lesion, but rare exceptions (atypia, phyllodes) should prompt appropriate surgical management. Future studies could enlarge the sample size, incorporate imaging-pathology correlation, and explore molecular markers to further refine diagnosis and patient care.

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