

# Clinico-Histomorphological Variations in Fibroadenoma

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## ABSTRACT

**Background:** Fibroadenomas are the most common benign breast tumors, which typically present as a mobile palpable breast lump. It accounts for approximately 75% of all breast lesions in young females. It can undergo a variety of histological variations, Like Apocrine metaplasia, adenosis, leaf like pattern, stromal growth, and myxoid change. Therefore, this study was done to evaluate the clinico- histomorphological variations in fibroadenoma.

**Methods:** A retrospective study was done over a one year period from January 2015 to December 2015 at S. Nijalingappa Medical College and HSK Hospital, Bagalkot, Karnataka, India. All cases of breast lump were confirmed as a fibroadenoma on histopathology were included in this study. A total of 224 cases were analyzed.

**Results:** The most common affected age group in the present study was 21–30 years of age (50.45%). The majority of them presented as a unilateral lump (56.70%) and very few bilateral (4.02%). The size varies between 3–5 cms and commonly located in upper lateral quadrant (54.91%). The predominant growth pattern noted was mixed intracanalicular and pericanalicular (55.35%). The most common histological changes noted were stromal overgrowth (12.05%) followed by apocrine metaplasia (9.37%), and cystic dilatation (8.92%). Rare variations such as lactational change (1.33%) and infarction (1.78%) were also noted.

**Conclusion:** There were numerous clinico-histomorphological variations in fibroadenoma, which can be confused with other benign breast diseases. Therefore, a through knowledge of these changes is necessary for accurate diagnosis of fibroadenoma.

**Key-words:** Benign Breast Diseases (BBDs), Breast tumors, Fibroadenoma, Histomorphological variants

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## INTRODUCTION

Benign Breast Diseases (BBDs) is a group of breast diseases which is not cancer. It is the most common cause of breast problems in females and it is more frequent than the malignant ones <sup>[1-6]</sup>. In fact, it is at least 10 times more common than breast cancer in the west <sup>[7]</sup>. Up to 30% of the women who suffer from BBDs will require treatment at some time in their lives <sup>[8]</sup>.

Fibroadenoma are the most common tumours clinically and pathologically in adolescent and women of child bearing age group; arising from the epithelium and stroma of the terminal duct-lobular unit of breast <sup>[9]</sup>. An oestrogen dependency has been suggested for the growth of fibroadenomas <sup>[10,11]</sup>. Mostly fibroadenomas present as a sharply demarcated, firm mass, usually not more than 3 cm in diameter. The cut surface is solid, grayish white, and bulging, with a whorl-like pattern and slit-like spaces <sup>[12]</sup>. In the present study, we tried to evaluate the changing pattern occurrence of fibroadenoma with a frequency of various clinico histomorphological variants.

## MATERIALS AND METHODS

Lumpectomy specimens of 224 patients with clinical impression and gross features suggestive of fibroadenoma breast were included. A retrospective study was done over a one-year period from January 2015 to December 2015 at

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Nijalingappa Medical College and HSK Hospital, Department of Pathology, Bagalkot, Karnataka, India. All cases of breast lump confirmed as fibroadenoma on histopathology were included in this study. A total of 224 cases were analysed by paraffin embedded haematoxylin and eosin stained slides. All cases were included only female patients and were studied in details in this study.

In past year, we observed in our institute that there were major differences in the occurrence of fibroadenoma and associated changes in adult age group. So we compared for various clinical (size, number, ipsilateral or bilateral presentation) and histological parameters including the pattern of growth, whether pericanalicular, intracanalicular or mixed; apocrine metaplasia, adenosis, epithelial hyperplasia, leaf like pattern, fibrocystic changes, stromal growth, atypical ductal hyperplasia and other changes like myxoid degeneration, hyalinization or fibrosis. The following criteria were used in the present series:

1. Fibroadenomas were classified as pericanalicular or intracanalicular when 90% of the tumour displayed that particular type of growth pattern. If neither type could be assigned to a tumour, we diagnosed it as mixed histologic type [13].
2. Leaf-like pattern (enhanced intracanalicular pattern) characterized by the projection of cellular stroma into clefts of cystic spaces [14].
3. Stromal overgrowth was defined as the presence of stroma without epithelium in any low-power field (×40) [15].
4. Epithelial hyperplasia, if present, was categorized as the usual type or atypical ductal hyperplasia according to the World Health Organization 2003 criteria [16].

**RESULTS**

In this study, the various parameters were taken according to age, location, quadrant, size, and histological changes. Out of 224 cases, the most common age group affected were 21–30 years (50.45%) with a mean of 25.5 years. The other age groups are shown in Table 1.

**Table 1:** Age Distribution of Fibroadenoma

Age (Years)	Total No. of Cases (n= 224)	Total percentage of Cases (n= 100%)
0–10 years	–	–
11-20 years	57	25.45
21-30 years	113	50.45
31-40 years	47	20.98
41-50 years	7	3.12
51-60 years	–	–

**Location wise distribution**

56.70% (127/224) cases were found in right breast. Among the 88 cases (39.28%) had a fibroadenoma in left breast while remaining 9 cases (4.02%) presented with bilateral fibroadenoma (Table 2).

**Table 2:** Location wise distribution

Site	Total No. of Cases (n= 224)	Total percentage of Cases (n= 100%)
Left Breast	88	39.28%
Right Breast	127	56.70%
Bilateral	9	4.02%

**Quadrant wise Distribution of Fibroadenoma**

Total 23/224 (54.91%) presented with a lump in the upper lateral quadrant. Remaining 89 patients (39.73%) had a lump in the upper medial quadrant. Rest 4/224 (1.79%), 5/224 (2.23%), and 3/224 (1.34%) had a lump in lower lateral, lower medial and central respectively (Table 3).

**Table 3:** Quadrant wise Distribution of Fibroadenoma

Quadrant	Total No. of Cases (n = 224)	Total percentage of Cases (n= 100%)
Upper Lateral	123	54.91
Upper Medial	89	39.73
Lower Lateral	4	1.79
Lower Medial	5	2.23
Central	3	1.34

**Size wise distribution in centimetres**

Lumpectomy specimens showed the varying range of size (< 2–20 cm). Fibroadenoma of the maximum diameter of 3–5 cm was found in 177/224 cases (79.02%). The 31/224 (13.84 %) shown <2 cm diameter. Remaining 16/224 cases (7.14 %) presented with a diameter of 6–10 cm. More than 11 cm was not found in this study showed in Table 4.

**Table 4:** Size wise distribution in centimetres (cm)

Size (cm)	Total No. of Cases (n= 224)	Total percentage of Cases (n= 100%)
<2	31	13.84
3 –5	177	79.02
6 –10	16	7.14
11–20	–	–
>20	–	–

**Clinico–Histological correlation**

**Histological changes according to growth pattern**

The frequencies of various histopathologic changes observed in the sections of fibroadenomas are shown in Table 5 & 6. Of these fibroadenomas, predominant pattern of growth was mixed histologic type (Pericanalicular and intracanalicular) in 124/224 cases (55.35%). Predominantly pericanalicular pattern was noticed in 31.70% (71/224) cases, while intracanalicular in 12.95% (29/224) cases. No significant difference was observed was shown in Table 5.

**Table 5:** Histological changes according to growth pattern

Histological changes (Predominantly Growth Pattern)	Total No. of Cases (n= 224)	Total percentage of Cases (n= 100%)
Predominantly pericanalicular	71	31.70
Predominantly intracanalicular	29	12.95
Mixed (Both pericanalicular and intracanalicular)	124	55.35

In this series, stromal growth 27 cases (12.05%), Apocrine metaplasia 21 cases (9.37%), and cystic dilatation 20 cases (8.92%) were common in younger females. 10 cases (4.46%) females showed atypical ductal hyperplasia and 9 cases (4.01%) showed epithelial hyperplasia. Leaf like pattern due to overt intracanalicular pattern was seen in 8 cases (3.57%). Other changes like adenosis, fibrocystic change, myxoid change, lactational change and infarction were also noted in 6 cases (2.67%), 5 cases (2.23%), 5 cases (2.23%), 3 cases (1.33%) and 4 cases (1.78%), cases respectively showed in Table 6.

**Table 6:** Secondary changes observed in 118 cases out of 224 cases

Histomorphological Variations	Total No. of Cases (n= 118)	Total percentage of Cases (n= 52.62%)
Apocrine metaplasia	21	9.37
Adenosis	6	2.67
Leaf like pattern	8	3.57
Fibrocystic change	5	2.23
Stromal growth	27	12.05
Epithelial hyperplasia	9	4.01
Myxoid change	5	2.23
Atypical ductal hyperplasia	10	4.46
Lactational change	3	1.33
Cystic dilatation	20	8.92
Infarction	4	1.78

**DISCUSSION**

The basic characteristic feature of all fibroadenomas is the proliferation of glandular as well as stromal elements with a sharply defined border and the pericanalicular or intracanalicular or mixed growth pattern. The enhanced intracanalicular pattern of some fibroadenomas bears a superficial resemblance to the cleft architecture of benign Phyllodes tumour and occasionally the distinction between the two tumour types may be difficult [9-12].

Fibroadenoma were stimulated by oestrogen and progesterone, pregnancy, and lactation, and they undergo atrophic changes in menopause [17-19]. This increasing rate of early presentation of fibroadenoma may be due to early or increased exposure to oestrogen, changing lifestyle. Exogenous hormone or hormonal imbalance; intake or oral contraceptive use may be underlying basic etiology. A number of factors are thought to increase chances of developing a fibroadenoma which includes dark-skinned race, high socioeconomic status, low body mass index (BMI), no or a low number of full-term pregnancies [20].

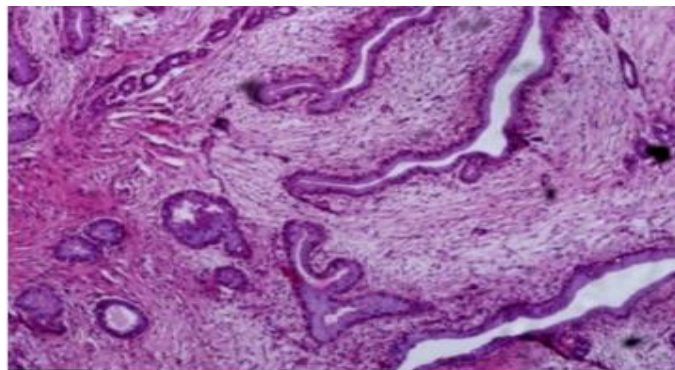
However, few studies shown that higher intake of fruits and vegetables, the higher number of live births, use of oral contraceptives and moderate exercise are associated with lower frequency of fibroadenomas [21]. In this present study, 55.35% (124/224) cases were presented with

predominant growth pattern of mixed histologic type. Other Histopathological features can be seen in association with fibroadenoma such as sclerosing adenosis, duct ectasia, apocrine metaplasia in 15% of cases, florid fibrocystic disease, and other features as infarction, calcification, epithelial metaplasia, and the inflammatory reaction may sometimes be present [22-24].

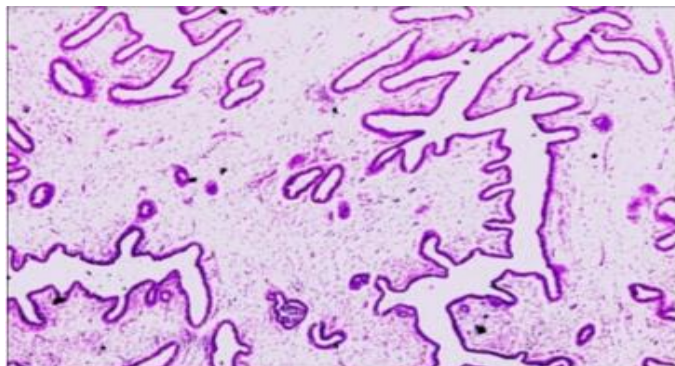
In this study, 27 cases (12.05%) showed stromal growth, 21 cases (9.37%) with apocrine metaplasia, 20 cases (8.92%) with cystic dilatation, 10 cases (4.46%) with atypical ductal hyperplasia, 9 cases (4.01%) with epithelial hyperplasia, 8 cases (3.57%) with leaf like pattern, 6 cases (2.67%) with adenosis, 5 cases (2.23%) of both fibrocystic change and myxoid change respectively, 4 cases (1.78%) with infarction and 3 cases (1.33%) with lactational change were noted.

It had been reported that malignant changes in fibroadenoma were found in only 0.1% of cases, usually involving the epithelial component, and the large majority were in situ lesions [23-25], while sarcomatous transformation of the stroma of fibroadenoma is believed to be an even rare phenomenon [24]. Approximately 20% of fibroadenomas have been found to have clonal chromosome aberration [26]. A lineage-restricted analysis has shown that these clonal aberrations are present in the stromal component suggesting that fibroadenoma is a benign neoplasm of the specialized stroma of the breast with an accompanying epithelial component [23,26].

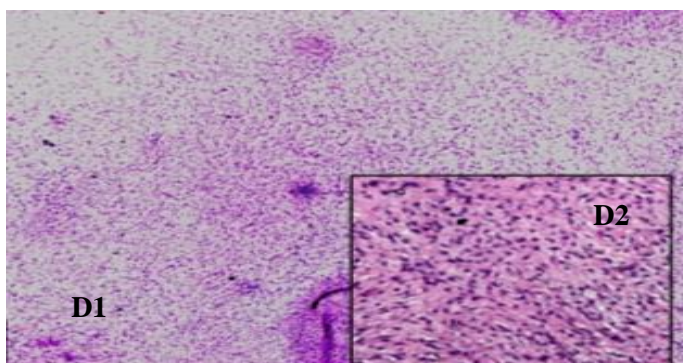
Finally, this study was an attempt to explore large variety of clinico histological features of fibroadenomas, some of which is expected to be of importance in the context of management of the patient. These changes may act as predictors of the outcome of the patients. Currently, there are no known identifiable characteristics to predict their unanticipated behaviour or recurrence, especially in younger patients so that we can avoid the aggressive treatment or proper follow up can be instituted. However, multi institutional and larger studies should be planned for further validation.



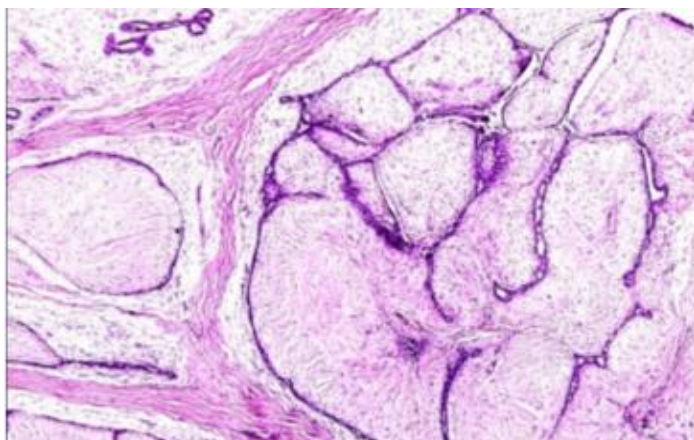
**Fig. 2:** Fibroadenoma showing pericanalicular pattern (H & E X 100)



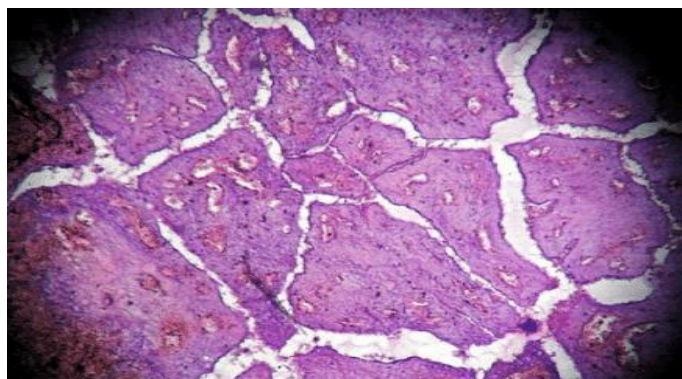
**Fig. 3:** Fibroadenoma showing Leaf like Pattern (H & E X 100)



**Fig. 4 (D1):** Fibroadenoma showing prominent stromal growth (H & E X 40)  
**Fig. 4 (D2):** Inset shows higher magnification (H & E X 400)



**Fig. 1:** Fibroadenoma showing intracanalicular pattern (H & E X 100)



**Fig. 5:** Fibroadenoma showing infarction (H & E X 100)

## CONCLUSIONS

The commonest fibroepithelial tumour in the female breast in the present study was fibroadenoma. A lump in the breast was the commonest presentation sometimes referred to as breast mouse. The common age group, which was affected with 21–30 years of age. Management of fibroadenoma may be conservative, but excision by total enucleation of the mass may be performed. Patients should undergo regular follow-up to assess complications, measure outcomes, and evaluate the need for subsequent reconstructive surgery. Throughout treatment, patients should be counselled about the benign nature of the mass, the different surgical and nonsurgical approaches, and the need for continued follow-up to determine if additional surgery is necessary. More long-term outcomes data will be needed to inform treatment recommendations for adolescent patients presenting with fibroadenomas of the breast.

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