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Original Research Article

Study of Histopathological Changes in Fibroadenoma of Breast

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Abstract

Background: Fibroadenoma represents a long-term risk for breast carcinomas especially in women with complex fibroadenomas, ductal hyperplasia, older women, or a family history of breast carcinoma.

Material and Methods: This prospective study was done in Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar from September 2021 to July 2022. Total 123 cases of fibroadenoma and further histopathological examination were done. Formalin fixed excisional breast biopsies of patients, with histopathological diagnosis of fibroadenoma was included in the study.

Results: Fibroadenomas were commonly encountered in the age group of 21–30 years (63.2%). 42.5% of Fibroadenomas had associated pathological entities. Complex Fibroadenomas were 1.5%, 0.9% of infarcts and 0.3% of Fibroadenoma with extensive squamous metaplasia. 24.3% of Fibroadenoma with fibrocystic disease, 12.3% of Fibroadenoma with varied degrees of hyperplasia and 0.3% of invasive carcinoma was noted. Incidental detection of even single case of carcinoma within Fibroadenoma emphasizes the need for comprehensive histopathological examination of all Fibroadenomas.

Conclusion: Fibroadenoma is a benign biphasic tumour and the commonest benign solid tumour in young women. They develop from a terminal duct lobular unit due to uncoordinated proliferation of the epithelial and stromal components.

Keywords: Histopathological changes, Fibroadenoma, Ductal hyperplasia, solid tumour.

Background

Fibroadenoma is a benign biphasic tumour and the commonest benign solid tumour in young women [1,2]. They develop from a terminal duct lobular unit due to uncoordinated proliferation of the epithelial and stromal components. Microscopically,

the admixture of stromal and epithelial proliferation gives rise to two distinct growth patterns. The epithelial component may show a wide spectrum of typical hyperplasia and metaplastic changes. Foci of fibrocystic change, sclerosing adenosis and even extensive myoepithelial proliferation can occur in fibroadenoma. Insitu lobular and ductal carcinoma occasionally develops within fibroadenomas [3,4].

The incidence of benign breast diseases is generally not well estimated but it is said to be rising during the second decade of life and peaks in the fourth and fifth decades [5,6]. Overall, fibroadenoma is the most commonly reported [7,8]. The risk of biopsy-proven benign breast disease is increased significantly by nulliparity, late age of first birth, and late menopause which is also factors known to be associated with increased risk of breast carcinoma. The aim of the present study was to make a thorough inventory of the histological features of the epithelium and stroma within and around breast fibroadenoma of cases.

Material and Methods

The present study was conducted in the Department of Pathology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar from September 2021 to July 2022. Total of 123 female patients diagnosed as fibroadenoma on histopathology were taken up for the study. Clinical data of patients regarding the age and side of the breast involved were retrieved from the medical records.

H & E (Hematoxylin and Eosin) stained slides were archived and studied for histopathological details. Fibroadenomas were clustered as pericanalicular or intracanalicular, when 90% of tumor was of a particular pattern if neither then mixed. Associated epithelial and stromal morphological variants were evaluated and tabulated. Among the proliferative epithelial changes, the most advanced lesion was taken for grouping.

Those fibroadenomas with one or more complex features like epithelial calcifications, apocrine metaplasia, sclerosing adenosis and cysts larger than 3 mm were categorized as complex fibroadenoma. Fibroadenoma with tubular adenoma was considered when a focus of densely packed uniform round uncompressed bilayered ducts with negligible stroma noted. Stromal expansion with increased cellularity and leaf-like pattern characteristic of phylloides if present focally was termed as FA with phylloides tumor.

Statistical Analysis

The data was analyzed using Statistical Package of Microsoft Excel and SPSS version 20.0 obtained parameters were evaluated using statistical analysis and presented in terms of percentage.

Results

Total 2936 female patients, 123(4.2%) were fibroadenoma. 78 (63.2%) females were in 2nd and 3rd decade of life with a mean age being 25.5 years.

Right side of the breast were affected in 51.4% and left side in 47.4%. Majority had unitary fibroadenoma 123 (97.3%) while multiple were noted in 3 (2.7%) cases. Of the total study group 71 (57.5%) of females had exclusive FAs while 52 (42.5%) had fibroadenomas associated with other pathological entities.

Table 1 depicts various epithelial and stromal histopathological metamorphoses occurring in fibroadenoma. Most consistent microscopic associated entity was fibrocystic disease (FCD) 12 (24.3%). 7 (12.6%) cases of proliferative epithelial hyperplasias were detected, of which one was invasive carcinoma in a clinically unsuspected young lady with FA. Infarcts in

FAs were 0.9% wherein all three cases showed residual pericanalicular and intracanalicular pattern in the margins of the lesion.

Table 1: Histopathological Changes with fibroadenoma (52 cases)

Histopathological Changes	No. of cases (n=52)	Percentage
Fibroadenoma with morphologic variants	12	6.25
• Hyalinization	2	1.05
• Squamous metaplasia	2	1.05
• Infarction	4	2.09
• Complex fibroadenomas	4	2.09
FA with fibrocystic change	20	10.5
FA with tubular adenoma	3	1.57
FA with phylloides	1	0.53
FA with lactation changes	1	0.53
FA with proliferative changes	15	7.9
• Mild hyperplasia	6	3.13
• Moderate hyperplasia	4	2.09
• Florid hyperplasia	2	1.05
• Atypical ductal hyperplasia	2	1.05
• Invasive carcinoma	1	0.53
Total	52	42.5%

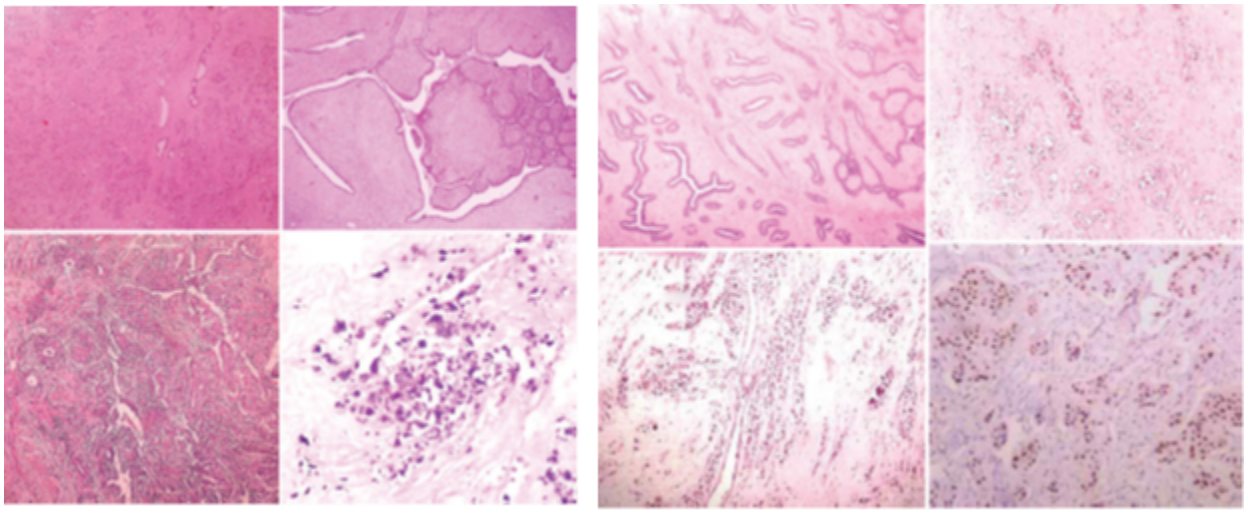

Figure 1:

1. H and E section (a) Fibroadenoma with tubular adenoma, (b) with phylloides, (c) atypical ductal hyperplasia, (d) calcification (×4)
2. H and E section (a) Fibroadenoma (b and c) malignant cells in cords surrounds the ducts, fibromyxoid stroma (×4), (d) Immunohistochemistry diffuse estrogen nuclear staining (×100)

Discussion

Fibroadenoma is the commonest benign breast disease in young females. In the present study majority of cases were in 2nd and 3rd decade of life similar to the studies by Bewtra [9]. Bilateral breast FAs were

perceived in 7.2% of cases comparable to a study by Onuigbo [10].

Right side of the breast was affected in 51.4% and left side in 47.4% analogous to a study by Vijaykumar *et al*. [11] and Kumar [12]. Predominant right sided the involvement of breast may be due to physical and social grounds [12]. However, side of the breast involved has no clinical or prognostic significance. Proliferating fibromyxoid stroma surrounding ducts in pericanalicular pattern was chief histologic feature in 50.9% cases, rest were intracanalicular 39.7%, and mixed 9.4% similar to a study by Kuijper *et al* [13].

Nevertheless this distinction has been observed to have no clinical outcome.

Extensive search of the literature revealed 48–50% of associated pathologies in fibroadenoma [14], while in the present study it was 42.5% (52 cases) [Table 1]. Morphological variants in fibroadenoma in the present study were 2 cases (1.05%) each of hyalinization and squamous metaplasia with begin within the myoepithelial cell layer. Further involving the entire ducts, acinus and leading on to the formation of epidermal cyst. Awareness of this rare entity within fibroadenoma is essential for it, not to be misdiagnosed as squamous cell carcinoma [15,16]. 4 cases (2.09%) of infarcts were noted in the present study.

Delaure and Redon were the first to describe spontaneous infarction in fibroadenoma in 1949 with the incidence of 0.5–1.5% of all fibroadenomas. Infarcts occur due to vascular failure and thrombosis of vessels during hypermetabolic status of pregnancy and lactation, while in young patients etiology though obscure possible trauma and fine needle aspiration cytology induced could be considered [17,18]. In the present study, two patients were in reproductive age group, and other was an elderly patient with the clinical diagnosis of malignancy. Hence, stresses the paramount of histopathology in all cases of fibroadenomas.

In the present study, 2.09% cases of complex fibroadenomas were noted in women aged more than 40 years. Dupont *et al.*, reported 22% of complex fibroadenomas and opined, complex fibroadenoma have 3.1 times the increased risk of invasive breast carcinoma in comparison to women with exclusive fibroadenoma in the general population [19]. In a study by Sklair-Levy *et al*. [20], 15.7% were complex fibroadenomas seen in older patients with a mean age of 47 years.

This increased number of complex fibroadenomas may be due to a longer period of study and a large number of cases. Documented literatures on management for complex fibroadenoma are very few. However study, by Greenberg *et al*. [21], recommends complete excision after diagnosis of a complex fibroadenoma. fibroadenoma with focus of tubular adenoma, lactational changes and phylloides tumor were noted in 1.4%, 0.6% and 0.9% respectively. Noguchi *et al*. [22], have documented progression of fibroadenoma to phylloides by clonal expansion of the stromal compartment. Phylloides have a tendency to recur and hence entails the necessity for wide excision of the lesion.

Among various morphological lesions FCD was the commonest associated pathology accounting to 10.5% that in contrast was 6.8% in a study by Shabtai *et al* [23].

Proliferative epithelial hyperplasias in fibroadenomas were seen in 15 patients. Average age of incidence of proliferative hyperplasia was 27 years, 38 years, 39 years and 38 years in mild, moderate, florid and atypical ductal hyperplasia respectively favoring the fact that progressive epithelial proliferative lesions could be a forerunner for invasive carcinomas. In a study by Kuijper *et al*. [13], found hyperplasia being

commoner associated lesions accounting to 43.9% in all age groups. And added hyperplasia within FA behaves in equivalence with otherwise normal breast parenchyma attributing to increased risk for progression to invasive carcinoma. Women with FAs harboring associated complex changes or hyperplasia need further surveillance especially if they have a strong family history of malignancy.

Conclusion

Fibroadenomas are the commonest benign biphasic fibroepithelial neoplasms occurring in 2nd and 3rd decade of life. The present study highlights various gamut of nonproliferative and proliferative changes seen in amalgamate within FAs, which may need further management and surveillance of the concerned patients. Hence, pathologist must conscientiously quest through all FAs and its various histopathological changes within them.

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