

Fine Needle Aspiration Cytology of Fibroadenoma of Breast in a Tertiary Level Hospital

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Abstract

Introduction: Fibroadenomas are one of the main benign diseases of the breast characterized by an admixture of stromal and epithelial tissue. Although more common in young women, it is seen in women of any age including those who are postmenopausal. Early diagnosis and treatment can relieve anxiety associated with nonmalignant conditions of the breast.

Materials and Methods: A study was conducted during 1-year period, and all cases with breast lesion underwent fine needle aspiration cytology (FNAC) or excision biopsy. A total of 315 cases were analyzed.

Results: Of the 315 cases of fibroadenoma, most were married urban women of age group 12 –20 years with average 11 months of symptoms (82%). The majority of fibroadenomas (50.1%) were 2-5 cm located in upper outer quadrant (40.8%).

Conclusion: Fibroadenoma is the most common benign lesions of the breast with maximum age of presentation <20 years in this study. FNAC serve as a rapid, economical, and reliable tool for the diagnosis of palpable breast lesions because of the cytopathological examination of these lesions before operation or treatment serves as an important diagnostic modality. Excision is the best treatment for women over 35 years to exclude malignancy.

Key words: Atypical ductal hyperplasia, Benign cystic diseases, Breast cancer, Fat necrosis, Fibroadenoma, Fine needle aspiration cytology

INTRODUCTION

Fibroadenomas are one of the main benign diseases of the breast characterized by an admixture of stromal and epithelial tissue. Although more common in young women, it is seen in women of any age including those who are postmenopausal. Although considered as a risk factor for the development of breast cancer, its reporting has been overshadowed by that of breast cancer. Fine needle aspiration cytology (FNAC) and radiological imaging- mammography and ultrasonography – as complements to clinical examination (triple test) have become the standard approach to investigations of palpable

breast lump. Early diagnosis and treatment can relieve anxiety associated with nonmalignant conditions of the breast. Since fibroadenoma and breast cancer can appear as similar lumps, it is currently recommended to perform ultrasound and possible tissue sampling and subsequent histopathological analysis to perform diagnosis. Unlike typical lumps from breast cancer, fibroadenomas are easy to remove, with clearly defined edges.^{1,2}

MATERIALS AND MEATHODS

This study was conducted in the Department of Pathology, Gauhati Medical College and Hospital located in Guwahati, Assam, for 1 year during the period 1st January 2016-31st January 2017. Material for the study comprised 315 patients presenting with breast lump either attending outpatient department or admitted in surgical wards, irrespective of age and sex. After taking detailed history, general, systemic and local examination of patient, which included age, marital status, age, rural or urban background,

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duration of symptoms, premenstrual and postmenopausal symptoms, number of lumps, and size, and location of lumps were conducted, and the provisional diagnosis was made. FNAC of breast lump was carried out. The samples were obtained with aspiration and nonaspiration techniques with minimum passes to minimize hemorrhage. Samples were smeared onto glass slides and fixed and stained with Giemsa stain. Cases of fibroadenoma with atypia, atypical ductal hyperplasia, and breast carcinoma were also stained with PAP stain for detailed study of nuclear features. After examining the smears, cytological diagnosis was made.

RESULTS

Our study included 315 cases in 1 year period from 1st January 2016 to 31st January 2017. The ages of cases ranged from 12-67 years of age and maximum number of cases were, in the age group of 21-30 years 96 cases [30.5%] followed by 12-20 years age 85 cases (27%) and 31-40 years 83 cases (26.3%) out of 315. Among the type of the lesions, fibroadenoma showed the highest 158 cases (50.1%) incidence followed by carcinoma 48 cases (15.2%) and benign proliferative lesions 23 cases (7.3%). Inflammatory lesions were abscess 15 (4.7%), chronic mastitis 5 (1.6%), granulomatous mastitis 4 cases (1.3%) and fat necrosis 01 (0.3%). Cystic lesions included galactocele 2 cases (0.6%), Benign cystic lesions 9 cases (2.9%) and fibrocystic diseases 5 cases (1.9%). Other than fibroadenoma benign neoplasms include lactating adenoma 4 cases (1.3%), benign phyllodes 3 cases (1%), and pleomorphic adenoma 1 cases (0.3%). Category of atypical ductal hyperplasia included 10 cases (3.2%).

Cases designated as “others” included fatty tissue 5 cases (1.9%), inadequate smears 20 (6.3%) and Schwannoma 1 case (0.3%). The highest number of fibroadenoma (158) was in the age group of <20 years 71 cases and 21-30 years group was second 54 cases. Maximum of carcinoma cases were in the age group of 41-50 and 51-60 years of age group (13 and 11, respectively). Among the inflammatory lesions, the highest number was seen in the age group of the 21-30 years group 13 cases.

Our study that was mainly focused on fibroadenomas were 158 cases out of 315 cases with size 2-5 cm, firm and mobile on examination. Highest number of fibroadenoma 158 (50.1%) was in the age group of <20 years, 71 cases (22.5%), and 21-30 years group was second 54 cases (17.1%), About 31-40 years 26 cases (8.3%), 41-50 years 5 cases (1.6%), 51-60 years 2 cases (0.6%) and 0 cases above 60 years. Youngest patient was 13 years of age and oldest patient was 51 years. The most cases were in the upper

outer quadrant. Side involvement showed mostly occurring in the left side 71 cases (44.9%) followed by right 64 cases (40.5%) and bilateral 13 cases (8.2%). There were 3 cases (1.9%) of cellular fibroadenoma out of which 2 were on the right side and one case bilateral. Fibroadenoma with atypia was 1 case (0.6%) on the right side. One case of fibroadenoma with atypia was also recorded. Microscopic pictures of fibroadenoma, cellular fibroadenoma, phyllodes tumor, and breast carcinoma along with Table 1 showing the different cases and their percentage of occurrence are shown in Figures 1-5.

DISCUSSION

Fibroadenomas arises in the terminal duct lobular unit of the breast. The typical case is the presence of a painless, firm, solitary, mobile, slow growing lump painless lump in the breast of a woman of childbearing years²⁻⁴ which in most cases were similar to our findings in our study. Fibroadenomas are partially hormone-related and

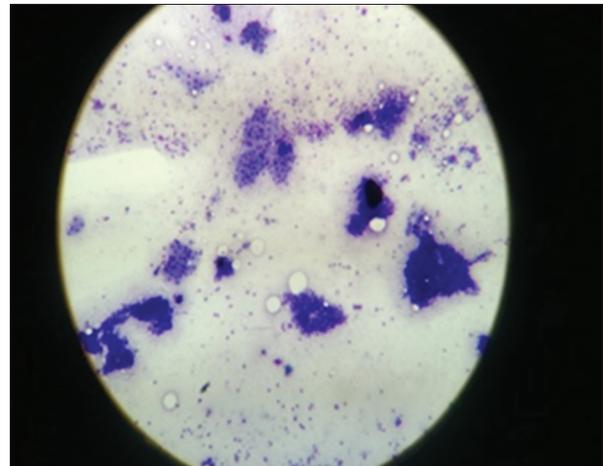


Figure 1: Microscopic picture of fibroadenoma (low power view)

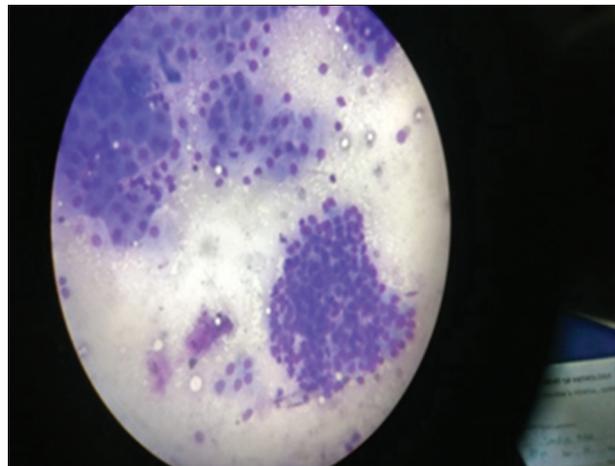
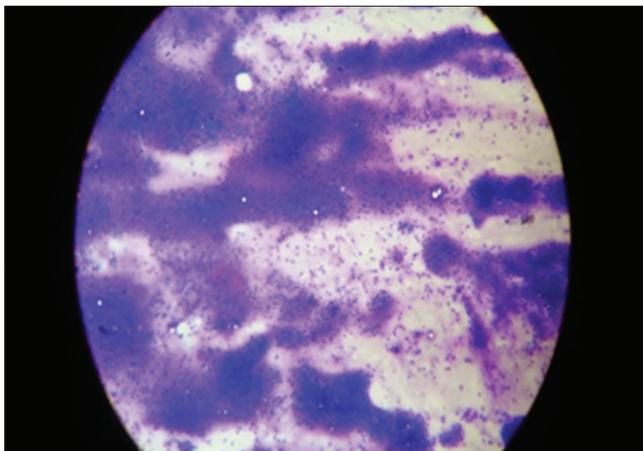
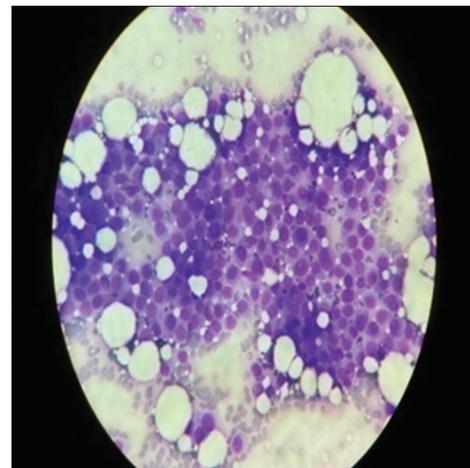
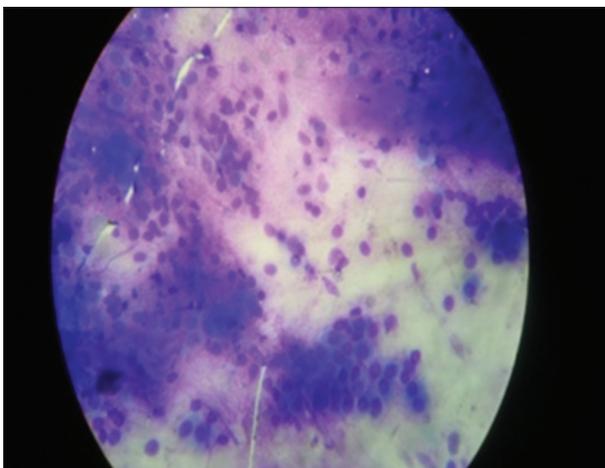


Figure 2: Microscopic view of fibroadenoma (high power)

Table 1: Different lesions of breast their age group and their percentage of occurrence

Lesion category	Diagnosis	Age upto 20 years	21-30 years	31-40 years	41-50 years	51-60 years	>60 years	Total (%)
Inflammation	Abscess	1	11	2	1			15 (4.7)
	Chronic mastitis	1	2	2				5 (1.6)
	Fat necrosis			1				1 (0.3)
	Granulomatous mastitis	1		3			1	4 (1.3)
Cystic lesions	Galactocele	1	1					2 (0.6)
	Benign cystic lesion	2		4	3			9 (2.9)
	Fibrocystic disease		3	2				5 (1.9)
Benign proliferative lesions		3	16	3	1			23 (7.3)
	benign Neoplasm							
	Lactating adenoma		3	1				4 (1.3)
	Fibroadenoma	71	54	26	5	2		158 (50.1)
	Benign phyllodes			2	1			3 (1)
	Pleomorphic adenoma			1				1 (0.3)
Atypia	Atypical ductal hyperplasia	1	1	6	1			10 (3.2)
	Suspicious of malignancy						1	1 (0.3)
Malignant neoplasm	Carcinoma		1	12	13	11	5	48 (15.2)
Others	Fatty tissue		1	2	1		1	5 (1.9)
	Inadequate smears	3	8	11	3	1		20 (6.3)
	Schwannoma						1	1 (0.3)
Total		85	96	83	29	14	9	315

**Figure 3: Microscopic picture of cellular fibroadenoma****Figure 5: Microscopic picture of breast carcinoma****Figure 4: Microscopic picture of phyllodes tumor**

frequently regress after menopause. The diagnostic findings on needle biopsy show a bimodal pattern like nonneoplastic breast tissue but are more cellular. The epithelial fragments are regularly arranged, cohesive cells are large elongated and branching, stag horn like. There is variable nuclear crowding and overlapping. The nuclei are mildly enlarged but uniform, have a bland granular chromatin and often one or two small nucleoli. Single, bare bipolar nuclei are scattered in the background. Myoepithelial cell nuclei are also frequently seen within the epithelial aggregates. Fragments of fibromyxoid stroma are obtained from most but not all fibroadenomas. These features can be well appreciated in our smears stained with Geimsa as shown in the microscopic pictures of our study. Theses epithelial

sheets tend to show typical metachromatic blue staining on DiffQuick staining. Foam cells and apocrine cells may also be seen, although these are less diagnostic features.^{3,5}

Fibroadenoma was the major 158 cases (50.1%) cause of breast lump in this study. 71 cases and 54 were in the age group of <20 and 21-30 years, respectively. Mayun *et al.*⁶ found average group of fibroadenoma was 16 years which is similar to our study. And nearly similar to (28%) to the findings of Ahmed *et al.*⁷ from Sudan among their 200 cases, except for the slight variation in the age group with more frequency at 21-30 years of age in their study.

A recent pathological review shows fibroadenoma as the most common lesion followed by cystosarcoma phyllodes and fibrocystic diseases of breast. Rangabashyam 1 and colleges in clinical study also showed fibroadenoma as the most common breast lesion but it was followed by inflammatory lesions and fibroadenosis.⁸ The study is similar to our study as fibroadenoma is the most common lesion 158 cases (50.1%), but in our study, fibroadenoma was followed by carcinoma 48 (15.2%) and benign proliferative lesions 23 (7.3%) which is quite different.

The rate of occurrence in women who were examined in breast clinics was 7-13%, while it was 7% in another cases of autopsies.^{9,10} Malignant transformation in epithelial components of fibroadenoma is generally considered rare. The incidence of a carcinoma evolving within a fibroadenoma was reported to be 0.002-0.0125%.¹¹ In our study, there was no such report of carcinoma arising in fibroadenoma.

In the male breast, fibroepithelial tumors are very rare and are mostly phyllodes tumor. Exceptionally, rare case reports exist of fibroadenoma in the male breast; however, these cases may be associated with antiandrogen treatment.¹² In our study, there was one case diagnosed and recorded as gynecomastia 45 years of age.

Higher intake of fruits and vegetable, higher no of live births, use of oral contraceptives, and moderate exercise are associated with lower frequency of fibroadenomas.¹³

Approximately, 90% of fibroadenomas are less than 3 cm in diameter similar to our case with size between 2 and 5 cm. However, these tumors have a potential to grow reaching a considerable size.

These tumors characteristically display hypovascular stroma compared to malignant neoplasms.^{2,4,5}

Up to 66% of fibroadenomas harbor somatic mutations in the exon 2 of the mediator complex subunit 12 (MED 12)

gene. In particular, these mutations are restricted to the stromal component.^{14,15}

A fibroadenoma is usually diagnosed through clinical examination, ultrasound or mammography and often a needle biopsy sample of the lump.³

Most are left *in situ* and monitored by a doctor, or the patient in question. Some are treated by surgical excision. They are left with a small margin of normal breast tissue if the preoperative clinical investigation is suggestive of the diagnosis. A small amount of normal tissue must be removed in case the lesion turns out to be phyllodes tumor on microscopic examination.^{5,16} In our department of surgery, most of the cases undergo surgical excision. Some fibroadenomas respond to treatment with ormeloxifene.¹⁷

Fibroadenomas have not been shown to recur following complete excision or transform into phyllodes tumors following complete or partial excision.⁷ But in our study, out of the 158 cases of fibroadenoma 3 cases were recurrent cases.

There are also natural treatments being tried to diminish fibroadenomas, such as fibrosolve, but no definite studies have been made as to improve their effectiveness.

The FDA has approved cryoablation of a fibroadenoma as safe, effective and minimally invasive alternative to open surgical removal in 2001.¹⁸ In the procedure, ultrasound imaging is used to guide a probe into the mass of the breast tissue. Extremely are used then used to destroy the abnormal cells,¹⁹ and over time the cells are reabsorbed into the body. The procedure can be performed in an office setting with local anesthesia only, leaves less scarring than open surgical procedures and no breast tissue deformation.¹⁹

The American Society of breast surgeons recommends the following criteria to establish a patient as a candidate for cryoablation of a fibroadenoma.¹⁸

1. The lesion must be sonographically visible.
2. The diagnosis of fibroadenoma must be confirmed histologically.
3. Lesion must be 4 cm in size lesions.

They are the most common breast tumor in adolescent women. They also occur in a small number of postmenopausal women. Their incidence declines with increasing age, and in general, they appear before the age of 30 years. Women with fibroadenoma have a slightly higher risk of breast cancer later in life. If the lump is left in place and watched carefully, it may need to be removed at a later time if it changes or grows.

CONCLUSION

Fibroadenomas are the most common benign lesions of the breast with maximum age of presentation <20 years in this study. FNAC serves as a rapid, economical, and a rapid tool for diagnosis of palpable breast lesions because of the cytopathological examination of these lesions before operation or treatment serves as an important diagnostic modality. Exision is the best treatment for women over 35 years to exclude malignancy.

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