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A clinic histomorphological study of spectrum of benign breast diseases

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Abstract
Context: Breast an organ which is constantly under the influence of sex hormones, is one of the frequent site of neoplasm in the human body. Benign breast diseases comprise a heterogeneous group of lesions that present with varying symptoms or detected incidentally.
Aims: To evaluate histopathological features of benign breast diseases and proliferative lesions having potential to progress to malignancy.
Materials & Methods: All lumpectomy and trucut biopsy specimens referred to the Central Diagnostic Laboratory of the Pathology Department at a tertiary care hospital for histopathological evaluation were enrolled in the study. This was a four year study which included two year retrospective and two year prospective study. H & E sections were studied, special stains and IHC was made use of wherever required.
Results: A total of 100 cases were studied. The most common lesion was fibroadenoma (29%) followed by benign followed by benign proliferative breast disease (11%), Gynaecomastia (10%) and fibrocystic change (7%). The proliferative lesions were more common in age group of 40-50 years. In patients with Black Chabon Score of 3, 4 (18.75%) were at increased risk for malignancy.
Conclusion: Breast tissue forms one of the major specimens received for histopathological examination. It is thus recommended that all women above the age group of 40 years presenting with a palpable breast lump or a suspicious non-palpable abnormality on screening mammogram to have their lump excised even though the lump is suspected to be benign.

Keywords: Benign, breast, fibroadenoma, proliferative lesions

Introduction
Breast an organ which is constantly under the influence of sex hormones, is one of the frequent site of neoplasm in the human body. It is during adolescent and reproductive years, major hormonal changes produce alterations in mammary gland, which directly or indirectly affects the disease pattern.
Benign breast diseases comprise a heterogeneous group of lesions that present with varying symptoms or detected incidentally [3]. All breast lumps are suspected to be carcinomas until proved otherwise.

Materials and Methods
The present study was carried out at the Central Diagnostic Laboratory of the Pathology Department at a tertiary care hospital. All the breast biopsies and lumpectomy specimens were enrolled in the study. A total of 100 cases were collected and studied over a period of four years.

Method of collection of data
All the tissue samples were fixed in 10% buffered formalin, embedded in paraffin and stained using haematoxylin and eosin (H & E). Special stains (Verhoeff's Van Giesons stain) and immunohistochemical markers (p63 and SMA) were employed wherever indicated.
Breast lesions were categorized into developmental abnormalities, inflammatory lesions, benign epithelial lesions, non-proliferative lesions (fibrocystic change), proliferative lesions and neoplasms.
Proliferative lesions were scored according to Black Chabon scoring system.

Table 1: Black Chabon Scoring System [4]

Score	Description
1, 2	Epithelial hyperplasia without atypia
3, 4	Epithelial hyperplasia with atypia
5	Ductal carcinoma insitu

Observation and Results

Benign breast lesions were distributed over a wide age group from <20years to >60 years. Majority of the lesions belonged to 40-50years age group and less number of patients were seen above 60years of age. (Table 2)

Table 2: Age Incidence among benign breast lesions

Age (years)	No of patients
<20	13%
20-30	25%
30-40	20%
40-50	28%
50-60	8%
>60	6%

Based on the classification of benign breast diseases, neoplasms were the most common category and benign epithelial lesions were the least common category. (Figure 1).

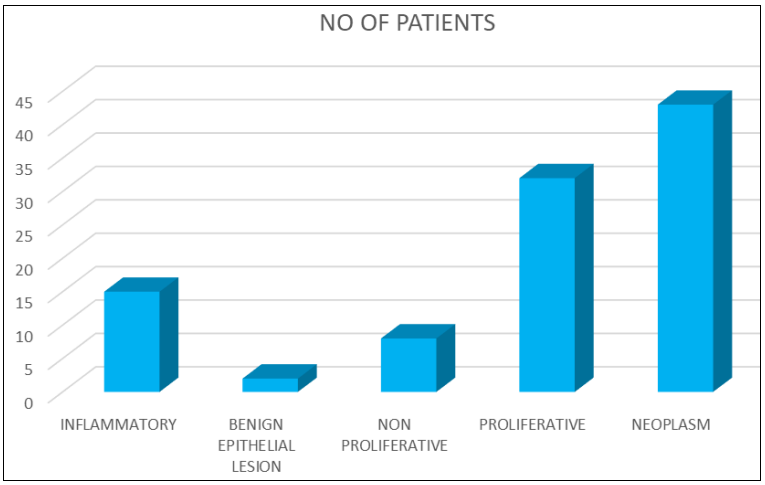

Fig 1: Classification of benign breast lesions

Among the benign breast lesions maximum number of patients were fibroadenoma and minimum number were of fibrocystic change.

Benign proliferative breast disease includes complex group of lesions that are usual ductal hyperplasia, sclerosing adenosis and atypical ductal hyperplasia. Of the benign proliferative breast lesions studied 81.25% had no atypia and 18.75% had atypia.

In the present study less common lesions were sclerosing adenosis, radial scar, tubular adenoma and galactocoele. Sclerosing adenosis and radial scar can mimic malignancy. Myoepithelial markers were done like p63 and smooth muscle actin (SMA) to rule out malignancy.

Table 3: Histological features in complex fibroadenoma

Changes seen	Number of patients
Fibrocystic change	21%
Apocrine metaplasia	15.78%
Usual ductal hyperplasia	10.52%
Atypical ductal hyperplasia	5.26%
Lactational change	5.26%

Among all the cases of fibroadenoma studied, complex fibroadenoma was the most predominant lesion. Complex fibroadenoma included changes like sclerosing adenosis, epithelial calcification and apocrine change.

Fibrocystic changes were seen in most patients which comprised of fibrosis, microcysts and macrocysts. Least common to be associated with fibroadenoma was atypical ductal hyperplasia and lactational changes. (Table 3).

Table 4: Black chabon scoring system for proliferative lesions

Score	Percentage of patients
1, 2	81.25%
3, 4	18.75%
5	0

To assess the risk of malignancy the proliferative lesions were scored based on Black Chabon Scoring System. Most patients in the current study had a score of 1, 2 which had a relative lower risk for malignancy when compared to score 3, 4. (Table 4)

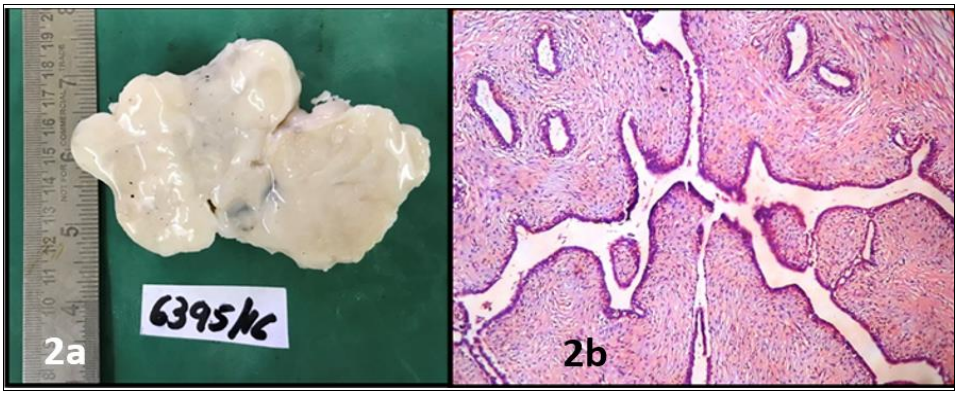

Fig 2: 2a) Gross picture 2b) Microscopy of intracanalicular pattern fibroadenoma (H & E, X400)

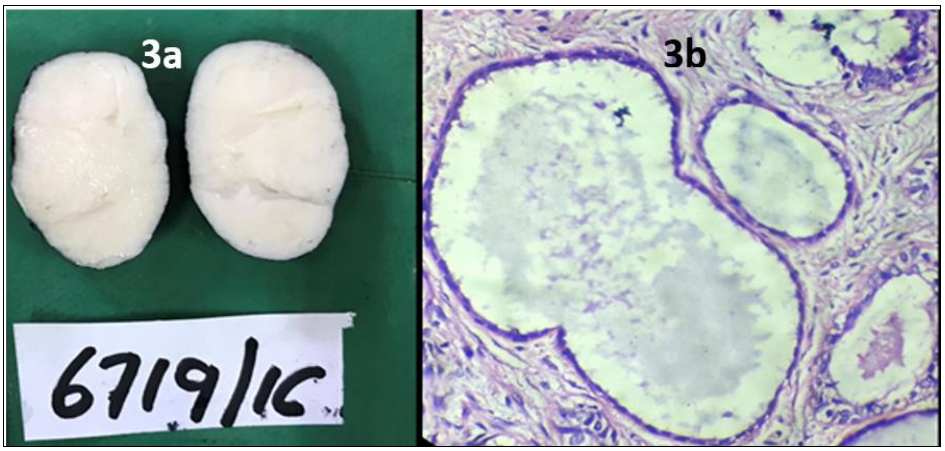

Fig 3: 3a) Gross picture of complex fibroadenoma 3b) Microscopy of macrocysts and microcysts (H & E, X400)

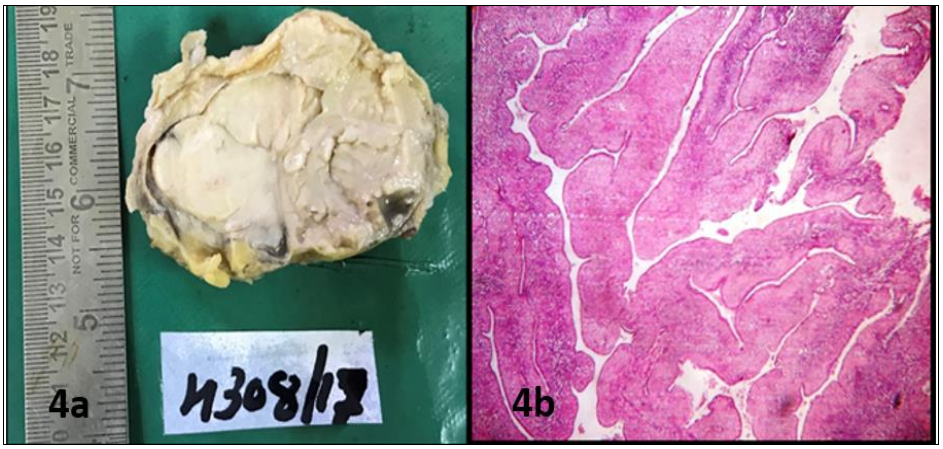

Fig 4: 4a) Gross photo 4b) Microscopy of cleft like spaces of phyllodes tumor (H & E, X100)

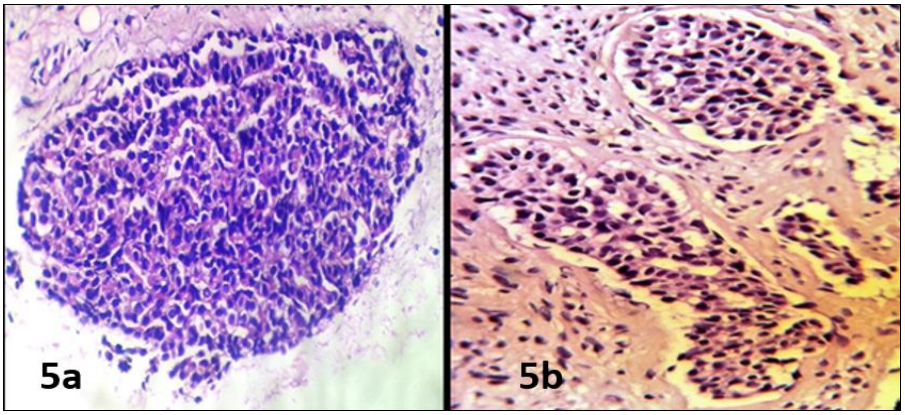

Fig 5: Microscopy of 5a) Usual Ductal Hyperplasia 5b) Atypical Ductal Hyperplasia (H & E, X400)

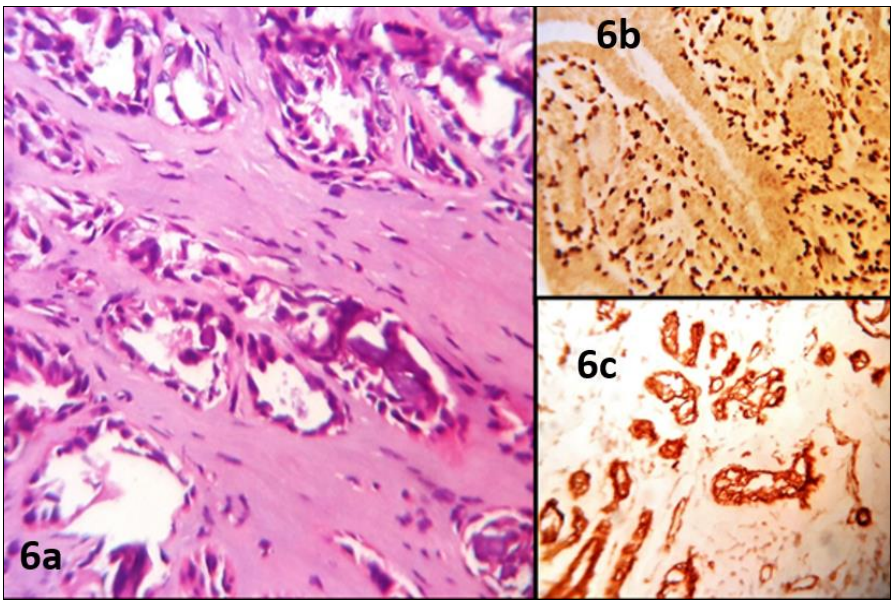

Fig 6: 6a) Microscopy of sclerosing adenosis (H & E, X400) 6b) Nuclear staining of p63 (IHC p63, X400) 6c) Membrane staining of SMA (IHC-SMA, X400)

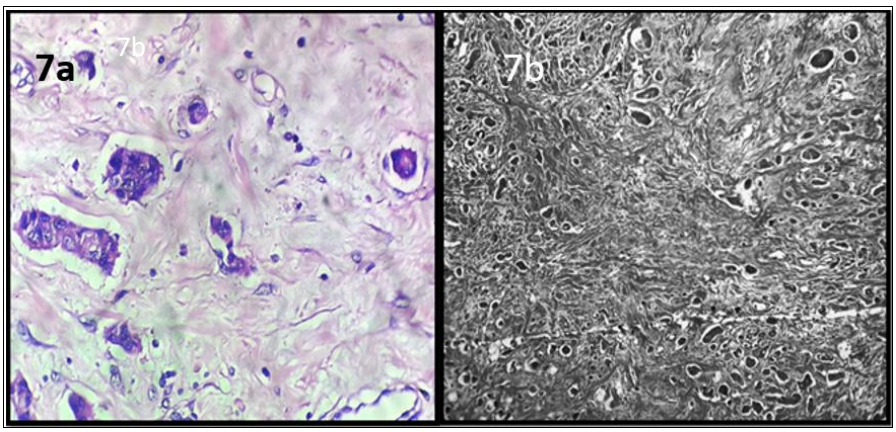

Fig 7: 7a) Microscopy of radial scar with ducts embedded in sclerotic stroma (H & E, X 400) 7b) Verhoeff stain to demonstrate central fibroelastotic stroma in radial scar (Verhoeff, X 400)

Discussion

According to Godwins *et al.* majority of benign lesions were of 20-30 years age. Parajuli *et al.* showed majority of the benign lesions occurring in 30-40 years of age. Both these studies were discordant with the current study (Table 5).

Table 5: Comparison of age incidence in benign neoplasms of breast

Age (yrs)	Amin *et al.* [5]	Parajuli *et al.* [6]	Shanti *et al.* [7]	Godwins *et al.* [8]	Present study
<20	15%	9%	11%	13.7%	13%
20-30	37.5%	32%	23%	39.3%	25%
30-40	28.5%	40%	23%	30%	20%
40-50	15.1%	14%	12%	10.4%	28%
50-60	3.9%	4%	5%	3.8%	8%
>60	-	1%		2.8%	6%

In the study conducted by Sangeeta *et al.* and Okoth *et al.* majority of the lesions were Fibroadenoma which was concondant with the present study. (Table 6)

Table 6: Comparison of spectrum of breast lesions

Lesions	Sangeeta *et al.* [9]	Parajuli *et al.* [6]	Sheik *et al.* [10]	Okoth *et al.* [11]	Hartman *et al.* [12]	Present study
Fibroadenoma	62.3%	39.4%	32.6%	56.9%	-	29%
Benign proliferative breast disease	-	-	-	17.9%	33.3%	11%
Gynaecomastia	3.6%	-	-	-	-	10%
Fibrocystic change	11.5%	18.4%	10.3%	20.5%	-	7%

According to the study done by Kujiper *et al.* and Shobtai *et al.* the predominant change seen in complex fibroadenoma

was apocrine metaplasia contrary to the present study in which fibrocystic change was the most common change. (Table 7).

Table 7: Histological features of complex fibroadenoma

Histology	Kuijper *et al.* [13]	Shabtai *et al.* [14]	Present study
Fibrocystic change	5.1%	-	21%
Apocrine metaplasia	28%	16.3%	15.78%
Usual ductal hyperplasia	5.3%	12.9%	10.52%
Atypical ductal hyperplasia	0.3%	-	5.26%
Lactational changes	0.5%	-	5.26%

Table 8: Proliferative breast disease in various studies

Proliferative disease	Dupont *et al.* [15]	Haagenson *et al.* [16]	Present study
No Atypia	71.8%	77.5%	81.25%
With Atypia	28.3%	22.5%	18.75%

In the present study majority of proliferative lesions had no atypia in concordance with study done by Dupont *et al.* and Haagenson *et al.* (Table 8).

To assess the relative risk of malignancy the proliferative lesions were scored based on Black Chabon Scoring System. The current data showed most cases with score 1, 2 in concordance with study conducted by Kodlin *et al.* and Mcdivitt *et al.* [4, 17]

Dupont *et al.* was the only person who defined atypia as Black-Chabon Score 4 and hyperplasia without atypia as Black-Chabon Score 3.The relative risk of proliferative disease with atypia was associated with four fold greater [15].

Conclusion

Breast tissue forms one of the major specimens received for histopathological examination. Breast cancer is one of the commonest causes of breast lump and is growing public health problem in our country.

In the present study, women in the reproductive age group diagnosed as benign breast disease on meticulous histopathological examination also had associated epithelial proliferative lesions which is the matter of concern. The epithelial proliferative lesions present along with other benign group of lesions, if associated with atypia then the women might subsequently develop malignancy in a much higher rate when compared to women with benign breast disease without associated proliferative lesions.

The incidence of cancer is higher in women above 30 years of age. It is thus recommended that all women above the age group of 40 presenting with a palpable breast lump or a suspicious non-palpable abnormality on screening mammogram to have their lump excised even though the lump is suspected to be benign.

Conflict of Interest

Not available

Financial Support

Not available

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