ORIGINAL ARTICLE

Clinicopathoradiological Study of Benign Breast Diseases

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Abstract

Context: Breast complaints are one of the most common reasons for surgical consultation. The majority ultimately proves to have a benign origin. Breast lesions may present with a variety of symptoms often confusing clinical evaluation leading to error in treatment of essentially benign conditions.

Aims and objectives: The aims and objectives of the article were to study the age incidence and clinical presentation of benign breast diseases (BBDs) and to assess the role of clinical examination and radiological imaging with histopathological confirmation of diagnosis in such cases.

Settings and design: This prospective study was conducted in the department of general surgery in 100 cases of BBDs.

Materials and methods: In this study, we have selected patients with age >10–60 years presenting with a palpable breast lump or breast pain in the surgical outpatient department (OPD) or referred from other departments for the same.

Results: The commonest age of presentation was between 20 and 40 years. More than half of the patients presented with only a lump as the chief complaint. The comparison correlation between preoperative investigations and histopathological correlation is statistically significant (p <0.001).

Conclusion: The majority of the BBDs occur in younger age group. The most common presenting complaints are lumps in the breast, pain in the breast, and followed by nipple discharge. Ultrasonography (USG) is very useful in diagnosing abscesses, cysts, and galactoceles.

Keywords: Benign breast diseases, Breast lump, Fibroadenoma.

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Introduction

Breast is a dynamic structure, which undergoes changes throughout women's reproductive life, and superimposed on this, cyclical changes throughout the menstrual cycle. The term benign breast disease (BBD) encompasses a heterogeneous clinical and pathological condition that ranges from inflammatory conditions to benign neoplastic conditions.

BBDs are a common disorder; up to 30% of women will suffer from BBDs requiring treatment sometimes in their lives. Pathogenesis involves a disturbance in the breast physiology extending from extreme normality to well-defined disease processes.[1] It is at least 10 times more common than breast cancer in a hospital clinic. Growing public awareness about breast diseases has increased visit to hospital clinics for breast symptoms and currently malignant to the benign disease patient at ratio of 1:10 are being seen in breast clinics.[2]

Breast complaints are one of the most common reasons for surgical consultation. The majority ultimately proves to have a benign origin.[3] Breast lesions may present with a variety of symptoms often confusing clinical evaluation leading to error in the treatment of essentially benign conditions.

Thus, the aims of this study were to exclude malignant breast conditions and to emphasize their presentation and treatment of BBDs. This study of BBDs includes 100 cases, where all possible attempts to study the various aspects of the diseases, their presentation, and management have been made.

Materials and Methods

This study was conducted in the department of surgery, in a hospital in northern India in 100 subjects over a period of 2 years with the following criteria and required materials and methods.

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Criteria for Inclusion

- All patients presenting with palpable breast lump in the surgical outpatient department (OPD) or referred from other departments for the same.
- Age >10–60 years.
- Breast pain but no palpable lumps were also included in the study.

Identification of all patients will be established by their name, age in years, sex, occupation, and marital status. The clinical history will be based on presenting complaints, past history, family history, with special reference to the presence of any breast disease in a first-degree relative, obstetrics and gynecological history with special reference to parity, hormone replacement therapy (HRT), contraception, and socioeconomic status.

Criteria for Exclusion

- Male patients.
- Already diagnosed cases of malignant breast disease elsewhere.

- Secondaries in the breast with primary elsewhere.
- Previously operated for breast lump/carcinoma.

The procedures of clinical examination and radiological and pathological investigations were explained in detail and informed consent was obtained. After taking a detailed history, a physical examination was done.

Physical Examination

It was done in a standard manner, with the patient sitting. The breasts were inspected for asymmetry, skin retraction, etc., and then palpated. A note was made of the quadrant in which the mass was present and the measurements of the same were noted. Both the breasts were examined to rule out the presence of any additional masses. The area of lymphatic drainage was examined for lymphadenopathy.

Sonomammogram

Two views mediolateral oblique and standard craniocaudal were obtained using a dedicated mammographic unit using radiation, and ultrasonography (USG) with high resolution was used mainly for cystic lesions.

Fine Needle Aspiration Cytology

Most of the aspirations were done in the pathology department on an outpatient basis. Complete clinical details and examination findings were noted.

Results

Disease Spectrum

In our study, fibroadenoma constitutes the most common BBD which is accounting for 55 cases followed by fibrocystic disease that consists of 23 cases. There were nine and seven cases of breast abscess and cyclical mastalgia, respectively. Two cases of galactocele were found and one case each of duct ectasia, lipoma, benign breast cyst, and antibioma was also found (Table 1).

Age Group

The most common age at the presentation is between 21 and 30 years and the least common age at the presentation is after 50 years of BBDs (Table 1).

- Fibroadenoma was the commonest presentation in the age group of 21–30 and 31–40 years of age with 34 and 18 cases, respectively.
- Fibroadenosis and cyclical mastalgia occurred commonly during the age range of 21–30 and 31–40 years, respectively.
- Breast abscess and galactocele occurred during the reproductive age.

The patient of benign breast cyst was aged 45 years and duct ectasia was aged 55 years.

Table 1: BBDs diagnosed by various modalities with age-wise distribution

	Age						
Type	*10–20*	*21–30*	*31–40*	*41–50*	*>50*	*Total*	*%*
Fibroadenoma	2	34	18	1		55	55.0
Fibroadenosis	3	13	7			23	23.0
Abscess		6	3			9	9.0
Cyclical mastalgia		4	3			7	7.0
Galactocele		2				2	2.0
Duct ectasia					1	1	1.0
Lipoma		1				1	1.0
Benign cyst				1		1	1.0
Antibioma		1				1	1.0
Total	**5**	**61**	**31**	**2**	**1**	**100**	**100**

Presentation

More than half of the patients presented with only a lump as the chief complaint. Twenty-nine patients presented with breast lump and associated pain. Seven patients presented only with pain as their chief complaint. Patients with lump and discharge were seven and fever and lump were five (Table 2).

There were 12 patients who were lactating when they presented with the complaints. All the cases of puerperal abscess and galactocele were lactating at the time of the presentation. There was a single case of antibioma in our study.

Region Involved

Right breast involvement was slightly more than left (43 vs 41%), whereas bilateral involvement was present in 9% of the cases (Table 2).

Patients according to the involvement of the quadrants, upper outer quadrant (UOQ), and tail of Spence involvement were 46% of the cases. Twenty-eight cases of fibroadenoma were involving the UOQ only. The next common quadrant was the lower outer quadrant involving 15 cases. Fibroadenosis involved upper outer and lower outer quadrants equally with bilateral involvement in five cases. There were four cases of breast abscess involving the lower outer quadrant and only one occurring bilaterally. All the other conditions involved the UOQ.

Clinical and Histopathological Examination (HPE) Correlation

In the present study, 65 cases were diagnosed as fibroadenoma clinically and underwent excision and histopathological study out of which 12 cases turned out to be of different diagnoses, of which most of them were fibroadenosis, one case turned out to be a lipoma, and one case turned out to be a benign breast cyst. Thus, the sensitivity of clinical diagnosis was 82%.

Out of the eight cases of fibroadenosis who underwent excision, two cases turned out to be fibroadenoma on the histopathological diagnosis. Thus, the sensitivity of clinical diagnosis for diagnosing fibroadenosis was 75%. Duct ectasia and antibioma were diagnosed correctly by clinical methods and were confirmed by histopathology after excision (Table 3).

Fine Needle Aspiration Cytology and HPE Correlation

In this study, fine needle aspiration cytology (FNAC) was performed in 82 cases out of which 70% were fibroadenoma, 25% were

Table 2: Distribution of sample by chief complaints and side involved

Chief complaints	*Frequency*	*Percentage*	*Side*	*Frequency*	*%*
Lump	52	52.0			
Pain	7	7.0	Left	41	41
Lump and pain	29	29.0			
Lump and discharge	7	7.0	Right	43	43
Lump and fever	5	5.0	Both	9	9
Total	**100**	**100**	**Total**	**100**	**100**

Table 3: Comparative correlation of clinical diagnosis and FNAC with histopathological confirmation

Disorders	*Clinical diagnosis*	*HPE confirmation*	*Difference in final diagnosis*	*Sensitivity of clinical diagnosis*	*FNAC*	*HPE confirmation*	*Difference in final diagnosis*	*Sensitivity of FNAC*
Fibroadenoma	65	53	12	82%	56	52	4	93%
Fibroadenosis	8	6	2	75%	16	13	3	82%
Duct ectasia	1	1	0	100%	1	1	0	100%
Breast cyst	0	1	1	0%	1	1	0	100%
Lipoma	0	1	1	0%	1	1	0	100%
Antibioma	1	1	0	100%	1	1	0	100%
Total	**85**	**63**	**22**		**76**	**62**	**7**	

Table 4: Findings on mammography and USG in the present series

	Mammography				*USG findings*	
Diagnosis	*BI-RADS 1*	*BI-RADS 2*	*BI-RADS 3*	*Total*	*Frequency*	*%*
Fibroadenoma		6	2	8	6	30
Fibroadenosis	1	2		3	6	30
Abscess				0	2	10
Cyclical mastalgia	1			1		
Galactocele				0	2	10
Duct ectasia			1	1	1	5
Lipoma				0	—	—
Benign breast cyst			1	1	1	5
Antibioma					1	5
Normal findings					1	5
Total	**2**	**8**	**4**	**14**		

fibroadenosis, and 5% constitute other benign lesions. Fifty-six cases of fibroadenoma diagnosed on FNAC underwent excision and out of which four cases turned out to be fibroadenosis. Thus, the sensitivity of FNAC for fibroadenoma was 93%. Sixteen cases of fibroadenosis diagnosed by FNAC underwent excision and three cases turned out to be fibroadenoma. Thus, the sensitivity of FNAC to diagnose fibroadenosis was 82%.

Duct ectasia, breast cyst, lipoma, and antibioma were all diagnosed by FNAC and confirmed by histopathology. Six cases underwent FNAC for mastalgia and no significant results were obtained (Table 3).

Radiological Investigations

In this present study, USG was done in 20 patients with breast problems. There were six cases each diagnosed as fibroadenoma and fibroadenosis. Breast abscess and galactocele were two in number.

Mammography was done for all patients who were more than 35 years of age and few patients with breast nodularity. Most of the cases were of fibroadenoma and belonged to breast imaging-reporting and data system (BI-RADS) 2 category.

Three patients who underwent mammography were diagnosed with fibroadenosis and one case of duct ectasia and one case of benign breast cyst also underwent mammography and both belonged to BI-RADS 3 category (Table 4).

Management

Twenty patients had undergone high-resolution breast ultrasound which revealed six cases each of fibroadenoma and fibroadenosis and seven other cases.

Fig. 1: Excision of breast lump

Fourteen females had undergone mammography which resulted in 58% fibroadenoma, 21% each of fibroadenosis, and other BBDs.

Out of 100 consecutive cases, 75 females underwent a biopsy which revealed 74% fibroadenoma, 17% fibroadenosis, and 3% other diseases (Figs 1 and 2).

In the present study, 70 cases underwent excision (Fig 3) of which 55 were of fibroadenoma and 12 were of fibroadenosis. All the patients with abscess underwent incision and drainage. There was a single case of duct ectasia who underwent microdochectomy. Lipoma, breast cyst, and antibioma all underwent excision.

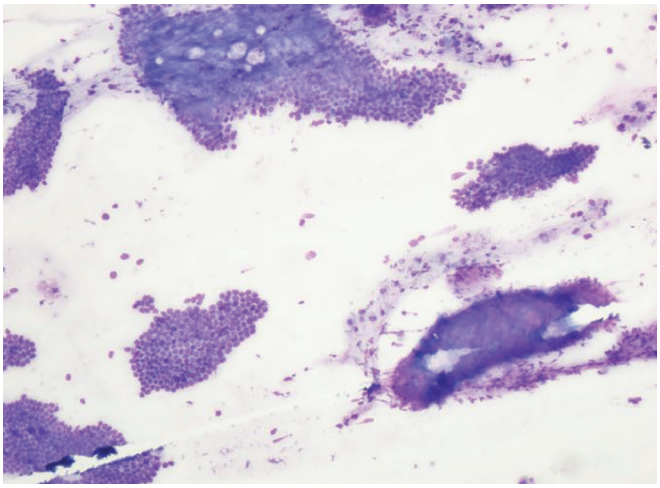

Fig. 2: FNAC of fibroadenoma

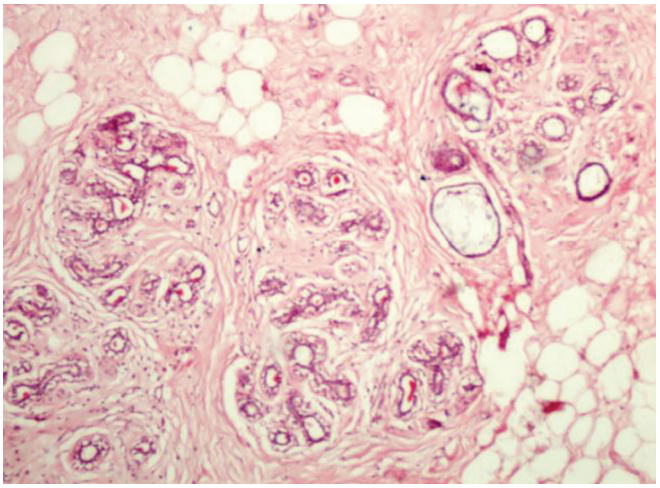

Fig. 3: Microphotograph showing fibrocystic disease

Eleven cases of fibroadenosis underwent conservative management with medications which included reassurance, proper breast support, Tab. Evening primrose oil (EPO), Tab. Vitamin E, etc.

The comparison correlation between preoperative investigations and histopathological correlation is statistically significant (p <0.001) (Table 5).

Table 5: Correlation between preoperative (FNAC, USG, and mammogram) and final histopathological findings

	FNAC (%)	*USG (%)*	*Mammogram (%)*	*HPE (%)*
Performed	**82**	**20**	**14**	**75**
Fibroadenoma	57 (70)	6 (30)	8 (58)	55 (74)
Fibroadenosis	21 (25)	6 (30)	3 (21)	17 (22)
Other BBDs	4 (5)	7 (35)	3 (21)	3 (4)
Normal	0	1 (5)	0	0

$\chi^2 = 35.14$; p value <0.001 (SIG.)

Discussion

The nomenclature of BBDs is very confusing. This is because over the last century a variety of clinicians and pathologists have chosen to describe a mixture of physiological changes and disease processes according to a variety of clinical, pathological, and etiological terminology. To sort out this confusion, a new system has been developed and described by the "Cardiff Breast Clinic," i.e., a comprehensive classification which puts all the processes of physiological changes, growth development, and involution into a single framework called aberrations of normal development and involution (ANDI)[4] (Table 6).

On comparing our study with other similar studies conducted in India, such as the studies of Rangabashyam et al.,[5] Shukla and Kumar,[6] Khanna et al.,[7] and Iyer and Gore,[8] we found a similarity in the incidence of fibroadenoma and fibroadenosis. The two groups of BBDs, i.e., fibroadenoma and fibroadenosis, constitute more than 78% of all BBDs.

Incidence of breast abscesses, breast cysts, galactoceles, and lipoma cases are comparable to other Indian studies, whereas mastalgia is not comparable to studies conducted by Shukla and Kumar and Khanna et al.[6,7] and Krishnaswamy,[9] wherein mastalgia was the most common presentation of BBDs.

In the studies conducted outside India, McFarlane,[10] Kareem and Ahmad,[11] and Khanzada et al.[12] showed a lower or equal incidence of fibroadenoma compared to fibroadenosis. The incidence of mastalgia was comparable to a study conducted by Khanzada et al.[12]

When we compared the age distribution of BBDs, we found that the commonest age of presentation was between 20 and 40 years which was similar to the study done by Iyer and Gore,[8] but our study had most of the patients in this age range among which 61% were in the age range of 20–30 years. Other studies had a higher incidence of patients in the age less than 20 and more than 40.

The incidence of benign breast lesions below the age of 20 years is 5%. The incidence of fibroadenoma was in contrast with a study done in Pakistan by Khanzada et al.,[12] in which they had 32% of the patients of less than 20 years of age.

The maximum number of fibroadenoma cases was in the age range of 21–30 years. Fibroadenosis cases were also more in this age range in comparison with the study by Khanzada et al.[12] Galactocele, lipoma, and antibioma were all found between 21 and 30 years.

The presentation of the patients was comparable to the study conducted by Shirley et al.[13] in Jamaica which was also a clinicopathological study. In the study conducted by Iyer and Gore,[8] all patients presented with a lump as their chief complaint, and 50% also had pain at the time of presentation. In our study, 52% presented with only a lump as their chief complaint, and 29% presented with a lump and pain. Pain was dull aching, nonradiating, continuous, and not in relation to menstruation.

Comparison of sides involved with other studies shows similar results. Left- and right-sided involvements are almost equal. A study done in Jamaica by Shirley et al.[13] had a higher incidence of bilaterality as compared to our study.

In general, most of the patients in the present study had the lesions in upper outer quadrant (UOQ) irrespective of the nature of lesions. Fifty-one percent of the patients with fibroadenoma had a lump in the UOQ, and out of 100 cases, 43% of cases have got lesions in the UOQ. These findings corresponded to the study conducted by Iyer and Gore[8] and to the Western literature where Cant et al.[14] have stated in this study that most of the lesions were in UOQ.

Table 6: ANDI classification of benign breast disorders

ANDI classification of benign breast disorders			
	Normal	*Disorder*	*Disease*
Early reproductive years (age 15–25 years)	Lobular development	Fibroadenoma	Giant fibroadenoma
	Stromal development	Adolescent hypertrophy	Gigantomastia
	Nipple eversion	Nipple inversion	Subareolar abscess
			Mammary duct fistula
Later reproductive years (age 25–40 years)	Cyclical changes of menstruation	Cyclical mastalgia	Incapacitating mastalgia
		Nodularity	
	Epithelial hyperplasia of pregnancy	Bloody nipple discharge	
Involution (age 35–55 years)	Lobular involution	Macrocysts	—
		Sclerosing lesions	
	Duct involution		
	Dilatation	Duct ectasia	Periductal mastitis
	Sclerosis	Nipple retraction	—
	Epithelial turnover	Epithelial hyperplasia	Epithelial hyperplasia with atypia

Sensitivity of Radiological Imaging

Imaging, mainly ultrasonographic examination alone, in this age group alone is rather disappointing. The present study showed the accuracy rates of 30% for fibroadenoma and 30% for fibroadenosis.

A study by Al Salamah[15] showed an accuracy rate of 81.8% that is quite similar to the most reported studies. The sensitivity of cytology and sonomammography for the diagnosis of fibroadenoma were 84 and 98%, respectively, by Carty et al.[16]

On breast USG, multiple lesions were detected in one case. Klein[17] states 97% diagnostic accuracy on USG. In Eltair et al.'s[18] study, USG was sensitive in 88.9% and specific in 97.4%. Both the cases of galactocele underwent therapeutic aspiration under ultrasound guidance. There is 100% sensitivity in galactocele and abscess.

Mammography was done for all patients who were more than 35 years of age and few patients with breast nodularity. Most of the cases were of fibroadenoma and belonged to BI-RADS 2 category. Role in BBDs was inconclusive. Mammography is only rarely indicated in very high-risk cases, especially above 30 years of age.

Findings noted in the study conducted by Hand et al.[19] and findings of the present study are almost similar to fibroadenoma, but there is a difference in cases of fibroadenosis. In the present study, the cytological diagnosis of fibroadenoma was 56, among which 52 (93%) were proved to be fibroadenoma on biopsy, which is similar to the study conducted by Hand et al.,[19] where cytological diagnosis as fibroadenoma was 29, among which 26 (89.6%) were proved to be fibroadenoma on biopsy.

These statistically significant data (Table 7) correlate to an extent with the studies by Carty et al.[16] and Al Salamah[15] in view of USG, mammography, FNAC, and HPE findings.

- HPE correlates with the study by Al Salamah 74 and 89%.
- FNAC correlates with both studies 70, 77, and 93.4%.
- Mammography correlates with the study by Al Salamah.[15]

The disparity between the correlation of imaging and pathological findings is due to the small sample size, poor socioeconomic status of the patient, and lack of awareness of the disease progression among these patients.

Patients were managed either *surgically* or *conservatively* depending upon the disease. For fibroadenoma, excision is the standard treatment. Recently due to a better understanding of the natural history of fibroadenoma, many studies[14,20,21] recommend the conservative management, especially in young patients under 25 years, provided that the cytological examination confirms the diagnosis. Treatment for giant fibroadenoma and juvenile fibroadenoma is enucleation. In a study by Dent,[22] 63 young women were diagnosed to have fibroadenoma. Thirty-one percent resolved and a further 12% became smaller over 13–24 months. Single fibroadenomas had a higher tendency for regression.

Table 7: Comparative correlation of clinical diagnosis with USG and mammography with FNAC and HPE

		USG	*Mammography*	*FNAC*	*HPE*
Carty et al.[16]	Fibroadenoma	93%	12%	77%	—
	Fibroadenosis	—	—	—	—
	Others	—	—	—	—
Al Salamah[15]	Fibroadenoma	81.8%	60%	93.4%	89.6%
	Fibroadenosis	6%	20%	3.8%	7.5%
	Others	12.1%	20%	1.9%	2.8%
Present study	Fibroadenoma	30%	58%	70%	74%
	Fibroadenosis	30%	21%	25%	22%
	Others	35%	21%	5%	4%

Conclusion

Majority of the BBDs occur in the younger age group. Majority of breast lumps are painless and are noticed accidentally by the patient. The most common presenting complaints are a lump in the breast, pain in the breast, and followed by nipple discharge.

Fibroadenoma and fibroadenosis are the most common BBDs. The early onset is attributed to early menarche. Fibroadenoma usually presents with a unilateral solitary lump, but multiple fibroadenomas in a single breast and both breasts may also be present. Diseases like ductal ectasia, lipoma, and antibioma are extremely rare.

BBD most commonly affects the UOQ. High-resolution ultrasonography (HRUSG) is very useful in diagnosing abscesses, cysts, and galactoceles. Mammography should be performed in females >35 years of age to rule out malignancy. FNAC is a sensitive and simple cost-effective investigation in BBD, and when it is inconclusive, biopsy is the ultimate choice for diagnosis.

Conservative treatment is one of the options in young women with breast lumps <2 cm in size and in cytologically confirmed cases of fibroadenoma and fibrocystic diseases. Surgery is the best treatment for the majority of the BBDs.

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