Spectrum of histopathological patterns of breast lesions in a tertiary care hospital

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ABSTRACT

Background: Breast lesions are areas of abnormal breast tissue. It is estimated that 20% of women develop breast lesions. Breast lesions are either benign or malignant. Breast carcinomas are the most common cause of deaths in women accounting for 10.6% deaths in India, 6.9% deaths per year globally. **Aims and Objectives**: To study various histopathological patterns of breast lesions in women admitted in Government General Hospital. **Materials and Methods:** It is a prospective study in the department of pathology, Government General Hospital, Nizamabad, from December 2020 to July 2022. Grossing was done and details noted, tissue bits were processed and sections were stained with conventional H and E Staining. **Results:** Out of 70 cases of breast lesions, 55 (78.5%) are benign breast lesions and 15 (21.5%) are malignant breast lesions. Fibroadenoma is the most common breast lesion accounting for 33 cases, that is, 60 %, followed by fibrocystic diseases (21.8%). Infiltrating ductal carcinoma of No Special Type is the most common malignant breast lesion accounting for 10 cases, that is, 66.6%. Among invasive breast carcinomas, the majority of cases are Grade II (69%). **Conclusion:** Study of histopathological patterns of breast lesions plays an important role in diagnosis, treatment, and prognosis of breast lesions. This study highlighted incidence and pathological characteristics of a wide range of breast lesions.

Key words: Breast lesions; Fibroadenoma; Fibrocystic disease; Infiltrating ductal carcinoma; Histopathological pattern

INTRODUCTION

The breast is a highly modified apocrine sweat gland, composed of both epithelial and connective tissue components and the range of diseases which affect it could be inflammatory or neoplastic (benign or malignant).[1] Diseases of the breast account for a significant proportion of general surgery workload globally making the breast one of the most commonly biopsied tissues currently.[1] A breast lesion whether benign or malignant, is a cause of anxiety to patients, but it is fortunate that the majority of breast lesions are proved to be benign.[2] Advances in imaging techniques and increased use of fine needle aspiration cytology have greatly assisted the preoperative evaluation of breast lesions. However, in a large proportion of cases differentiation between benign and malignant breast lesions still rests on histopathological examination.[3] Breast cancer is one of the most common neoplasms in females accounting for 10.6% in India and 6.9% globally (GLOBACAN).[4] Various studies have reported benign breast disease (BBD) to be more common than malignant breast lesions.[1] The range of BBD in various studies is between 59.5% and 76.6% with fibroadenoma being most common BBD.[1] Malignant breast lesions accounted for 23.4–40.5% in the previous studies.[1] This study aims to describe the different histopathological patterns and grading of breasts.

Aims and objectives

The aim of the study was to study various histopathological patterns of breast lesions in women admitted in Government General Hospital (GGH), Nizamabad, a tertiary care center.

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MATERIALS AND METHODS

It is a prospective study in the department of pathology, GGH, Nizamabad, from December 2020 to July 2022. Specimens such as lumpectomy, incisional biopsy/trucut biopsy, and mastectomy were received from the department of surgery. The patient details were taken such as age, tumor location, and laterality. These biopsy specimens were fixed in 10% formalin. The tissue specimens were processed routinely, and paraffin embedded tissue was cut on microtome to the thickness of 3–4 microns. The sections were stained with conventional H and E stain. Sections were examined under microscope and details were noted including tumor grading as per the Elston-Ellis modification of the Scarff-Bloom-Richardson grading system. In this grading system, three histopathological factors such as tubule formation, nuclear pleomorphism, and mitotic count of breast cancer were taken for consideration, total score were added and determined the histopathological grade of breast cancer as Grade I, Grade II, and Grade III.

Modified Scarff-Bloom-Richardson histologic grading
Tubule formation
Score 1: >75% of tubule formation
Score 2: 10–75% of tubule formation
Score 3: <10% of tubule formation
Nuclear pleomorphism
Score 1: Small regular nuclei; similar to normal ductal nuclei
Score 2: intermediate size; 1.5–2 times the size of normal ductal nuclei
Score 3: high-grade nuclei; >twice the size of normal ductal nuclei
Mitotic count
Score 1: 0–7 mitoses/10HPF
Score 2: 8–14 mitoses/10HPF
Score 3: >15 mitoses/10HPF
Nottingham combined histologic grade
Score 3–5: Well differentiated (Grade I)
Score 6–7: Moderately-differentiated (Grade II)
Score 8–9: Poorly-differentiated (Grade III)

The aim of the study was to study the spectrum of histopathological patterns of breast lesions in the pathology department of GGH, Nizamabad during the study period.

Inclusion criteria
The following criteria were included in the study:
1. Patients who are admitted with a history of breast lump in surgical department, GGH, Nizamabad
2. Female patients of pubertal age group (10–14 years), reproductive age group (15–49 years), postmenopausal age group (above 50 years) are taken in to study
3. Specimens from excisional biopsy, incisional biopsy, and trucut biopsy are taken in to the study.

Exclusion criteria
1. Women who have been treated for breast malignancy earlier were excluded from the study
2. Female of prepubertal age group (<10 years) are excluded from the study
3. Male breast lumps are excluded from the study.

Ethical considerations and permissions
The study was started after due approval from the institutional ethical committee.

RESULTS

Seventy cases of breast lesions were studied over a period of 2 years from December 2020 to July 2022. Among 70 cases, benign breast lesions constituted 55 cases (78.5%) and malignant breast lesions 15 cases (21.5%). The ages of cases ranged between 11 years and 70 years (Table 1). The peak age of occurrence of BBD was found between 21 and 30 years age group, that is, 63%, youngest case detected as fibroadenoma at 14 years of age. Malignant breast disease was found to be between 41 and 60 years, accounting for 73.6%, youngest case diagnosed as infiltrating ductal carcinoma at 32 years of
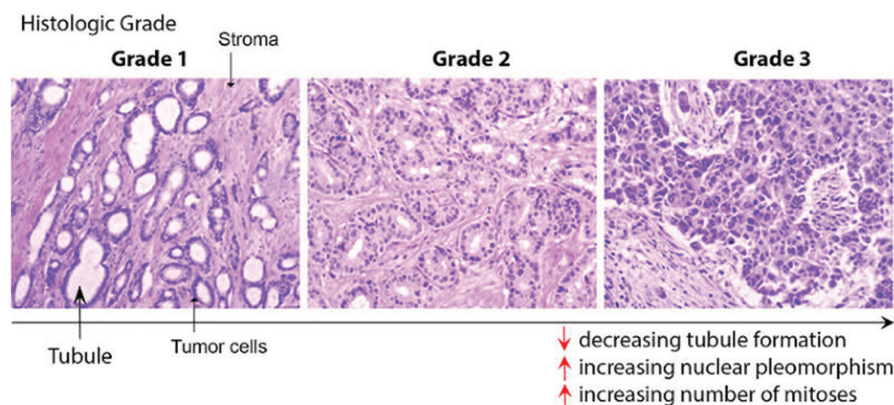

Histologic Grade

Grade 1 — Stroma — Tubule — Tumor cells
Grade 2
Grade 3

↓ decreasing tubule formation
↑ increasing nuclear pleomorphism
↑ increasing number of mitoses

Table 1: Age-wise distribution and different histopathological lesions of benign and malignant breast lesions

Age group (in years)	Benign lesions (%)	Malignant lesions (%)	Total (%)
11–20 years	06 (10)	00	06 (8.5)
21–30 years	35 (63)	00	35 (50)
31–40 years	10 (19)	02 (13)	12 (17)
41–50 years	03 (5.4)	07 (47)	10 (14)
51–60 years	01 (1.8)	04 (26.6)	05 (7.1)
61–70 years	00	02 (13)	02 (2.8)
71+years	00	00	00
Total	55 (78)	15 (22)	70 (100)

Table 2: Distribution of breast lesions

| Benign breast lesions		No. of cases (%)
1.	Fibroadenoma	33 (60)
2.	Fibrocystic disease	12 (21.8)
3.	Phyllodes tumor	04 (7.2)
4.	Fibroadenosis	02 (3.6)
5.	PASH	02 (3.6)
6.	Lactating adenoma	01 (1.8)
7.	Tubular adenoma	01 (1.8)
Malignant breast lesions		
1.	Infiltrating ductal carcinoma - no special type	11 (73.3)
2.	Ductal carcinoma *in situ* - solid pattern	01 (6.6)
3.	Ductal carcinoma *in situ* - comedo pattern	01 (6.6)
4.	Inflammatory carcinoma	01 (6.6)
5.	Mucinous carcinoma	01 (6.6)

PASH: Pseudo angiomatous stromal hyperplasia

Table 3: Histopathological grading of breast carcinoma

Malignant breast lesions	Grade I (%)	Grade II (%)	Grade III (%)
Infiltrating ductal carcinoma-NST	01 (7.6)	06 (46)	03 (23)
Infiltrating ductal carcinoma-matrix producing	-	01 (7.6)	-
Inflammatory carcinoma	-	01 (7.6)	-
Mucinous carcinoma	-	01 (7.6)	-
Total	01 (7.6)	09 (69)	03 (23)

age and oldest case diagnosed as inflammatory carcinoma at 66 years of age.

Among the 55 cases of benign breast lesions, 33 cases (60%) were of fibroadenoma, 12 cases (21.8%) were fibrocystic disease (Figure 2), 4 cases (7.2%) were benign phylloid, other benign breast lesions such as fibroadenosis, pseudo angiomatous stromal hyperplasia (Figure 1), lactating adenoma, and tubular adenoma (Figure 3) were also seen. Among benign breast lesions, fibro adenoma
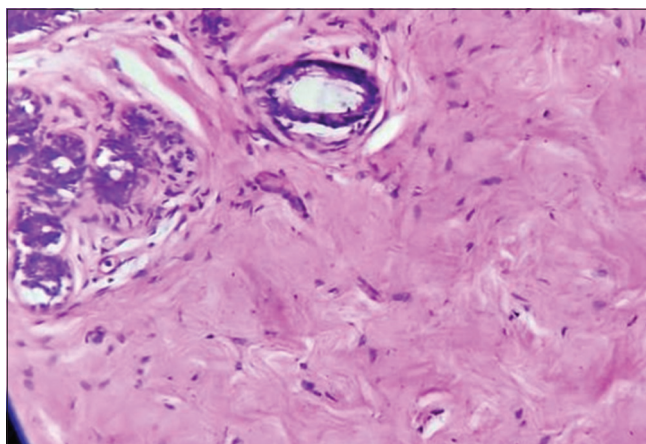
Figure 1: H and E of pseudo angiomatous stromal hyperplasia -20x
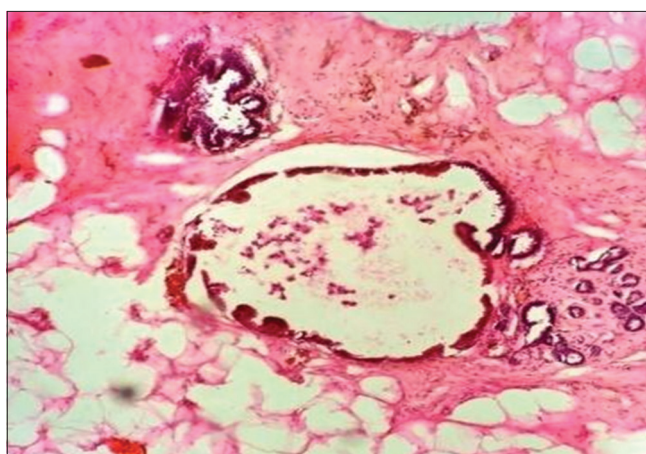
Figure 2: H and E of Fibrocystic disease-20x
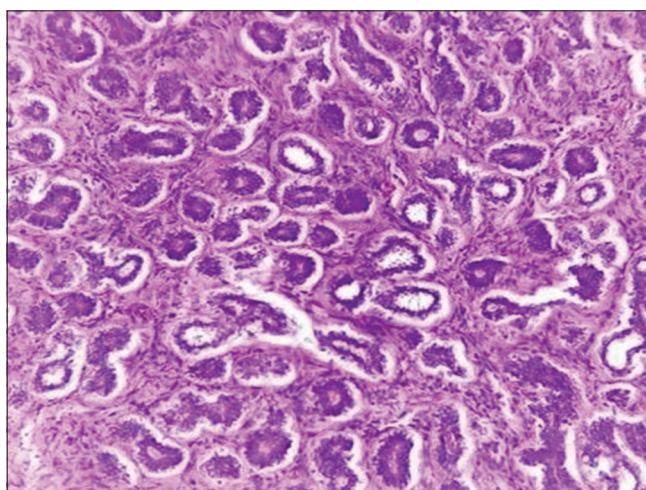
Figure 3: H and E of Tubular adenoma-20x

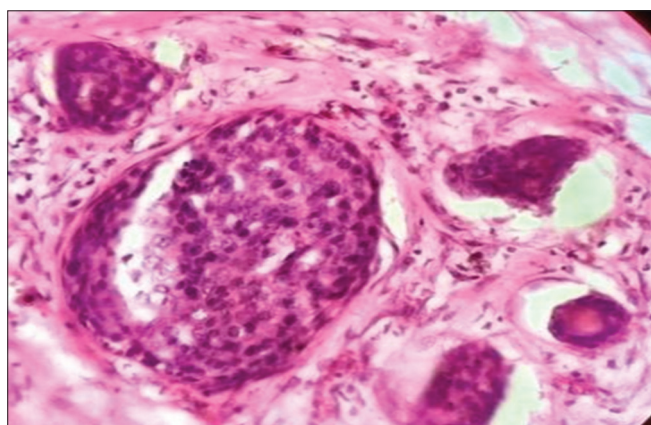was the 1st most common followed by fibrocystic disease (Table 2).

Among 15 cases of malignant breast lesions, ten cases (66.6%) were infiltrating ductal carcinoma, two cases were ductal carcinoma *in situ* (Figures 4 and 6). Other cases such as

Table 4: Comparative study of benign breast lesions and malignant breast lesions

Benign breast lesions	Sangeeta et al., 2009[12] (%)	Malik and Bharadwaj 2003[13] (%)	Present study (%)
Fibroadenoma	62.32	55	60
Fibrocystic disease	11.5	28.38	21
Phylloides tumors	1.45	1.27	7.2
Fibroadenosis	4.35	0.32	3.6
Lactating adenoma	4.35	0.87	1.8
Malignant breast lesions	**Dauda et al., 2011[14]**	**Njeze 2014[15]**	**Present study**
Infiltrating ductal carcinoma	78.8	53.6	73.2
Ductal carcinoma *in situ*	-	-	8
Mucinous carcinoma	2.4	7.1	6.6
Inflammatory carcinoma	-	-	6.6

Table 5: Comparative study of grading of breast carcinomas

Grade of tumor	Siddiqui et al., 2003[6] (%)	Ambroise et al., 2011[16] (%)	Azizun-Nisa et al., 2008[17] (%)	Present study (%)
I	11.38	9.4	6.7	7.3
II	59.17	57.4	55.3	69
III	29.47	33.3	38	23

Figure 4: H and E of DCIS - solid pattern -20x
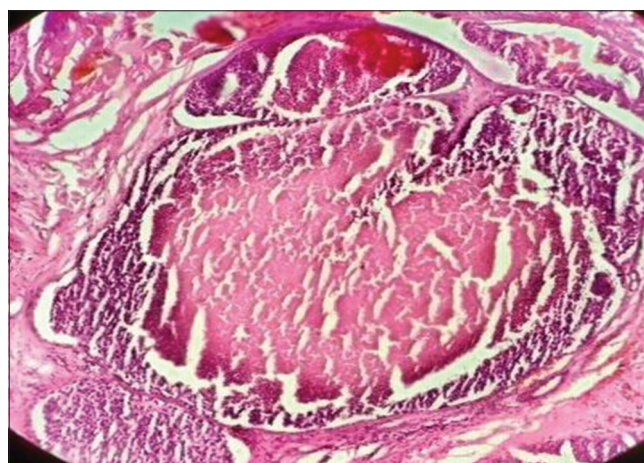
Figure 6: H and E DCIS - commode necrosis ×20
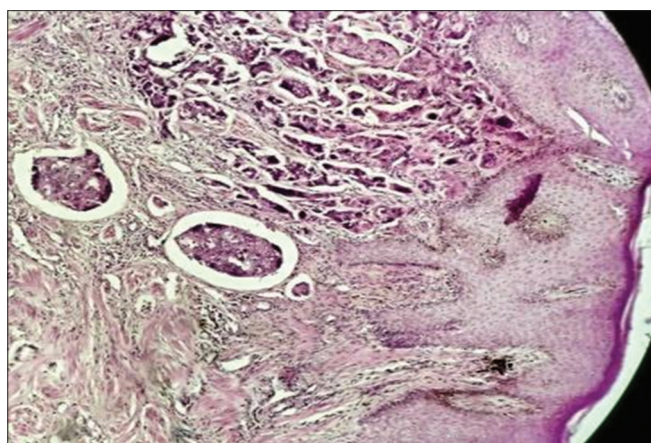
Figure 5: H and E of Inflammatory carcinoma-20x

inflammatory carcinoma (Figure 5) and mucinous carcinoma are also seen. Among malignant breast lesions, infiltrating ductal carcinoma was the most common lesions (Table 2).

In our study, grading was done in 13 cases of invasive carcinomas, of which the majority (46%) had Grade II, followed by Grade III and Grade I with 23% and 7.6%, respectively. Mucinous and inflammatory carcinoma belongs to Grade II.

DISCUSSION

The human breast is composed of specialized epithelium and stroma that may give rise to both benign and malignant breast lesions.[5] Breast lesions are more common in females than male. The histopathological pattern of breast lesion and their etiology varies among different countries and ethnic group.[6] Benign breast lesions are more common than malignant breast lesions. Risk factors for both benign breast lesions and malignant breast lesions include multiparty, low parity, low age at first child birth and

late menopause, highlighting the fact toward excessive circulating estrogen.[7,8] The present study was conducted to assess histopathological study of biopsies of breast lesions.

In the present study, benign breast lesions accounted for 78%, which was similar to the studies done by Hatim et al.,[9] (80.7%). Malignant breast lesions accounts for 22%, which was similar to the studies done by Kumbhakar and Talukdar[2] (23.4%). In our study, most of benign breast lesions are seen between age group of 21 and 30 years accounting for 63% similar to studies done by Christiana et al., (60%).[10] Most malignant breast lesions occurred between 41 and 50 years accounting 47% similar to the studies done by Hankey et al.,[11] (46%). In our study, the most common breast lesion was found to be fibroadenoma and the most common malignant breast lesion was infiltrating ductal carcinoma.

In our study, fibroadenoma is the most common benign breast lesion accounting for 60% which is compared with the studies done by Sangeeta et al.,[12] and Malik and Bharadwaj[13] Fibrocystic disease is the 2nd most common disease in our study accounting for 21% which is similar to the studies done by Malik and Bharadwaj[13] The incidence of phylloides tumor is 7.2% which is higher than studies done by Malik and Bharadwaj[13] and Sangeeta et al.,[12] that is, 1.2% and 1.7%, respectively. The incidence of fibroadenosis and lactating adenoma is 3.6% and 1.8%, respectively (Table 4).

In our study, among malignant breast lesions, infiltrating ductal carcinoma is most common accounting for 73.2% which is similar to studies done by Dauda et al.,[14] that is, 78.8%. Incidence of mucinous carcinoma is 6.6% which is similar to studies done by Njeze,[15] that is, 7.1%. Incidence of inflammatory carcinoma is 6.6% which is similar to Hatim et al.,[9] that is, 6% (Table 4).

In the present study, the majority of breast cancers were in Grade 2 accounting for 69%, followed by Grade 3 (23%), similar to Siddiqui et al.,[6] 59.17% and 29.47%, respectively. Grade 1 accounting for 7.6%, similar to Azizun-Nisa et al.,[17] 6.7% (Table 5).

Limitations of the study

Women who have been treated for feast malignancy earlier were excluded Male breast lumps are excluded from study

CONCLUSION

We have studied a total of 70 cases of breast lesions histopathologically, in which benign breast lesions are more in number than malignant breast lesions. The benign tumors were most frequent in second, third decades, malignant tumors were mostly seen beyond 4th decade. Fibro adenoma was the most common benign tumor followed by fibrocystic disease. Invasive carcinoma - No special type was the most common malignant tumor. Most of the invasive carcinomas belong to Grade II. Hence, histopathological study of breast lesions plays a very important role in diagnosis, treatment, and prognosis of breast lesions.

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Authors' Contributions:
AM- Concept and design of the study, prepared first draft of manuscript, review of literature revision of manuscript; **MIA and NCR-** Interpreted the results; reviewed the literature and manuscript preparation; **SS-** Concept, coordination, statistical analysis and interpretation, preparation of manuscript, and revision of the manuscript.

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Source of Support: Nil, **Conflict of Interest:** None declared.