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Histomorphological Analysis Of Breast Lesions

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Abstract

Introduction: Breast lesions are one of the commonest problems encountered in women. These lesions are frequently seen in younger to middle aged women and often they go undetected for various reasons. Breast lesions can be non-neoplastic, benign or malignant lesions.

Aim: The purpose of the study was to analyze histomorphological spectrum of breast lesions.

Objective: 1. To analyze age and gender wise distribution of breast lesions
2. To analyze histopathological types and frequencies of breast lesions
3. To analyze clinicopathological correlation of breast lesions.

Materials and methods: Retrospective study of various breast lesions biopsies, lumpectomy and Modified Radical Mastectomy (MRM) specimen received in the histopathology section of department of pathology from January 2021 to September 2022. The histopathological diagnosis was made after routine processing and hematoxylin - eosin staining.

Results: A total of 177 breast lesions were analyzed. 125 (70.6%) of these lesions were either inflammatory or benign proliferative/ non neoplastic lesions while 52 (29.4%) were malignant neoplasms. Mastitis was the most common non neoplastic breast lesion with (52.1%). Fibroadenoma was the most common benign breast lesion with 82 (65.6%) cases. Invasive duct carcinoma was the most with 45 (86.5%) cases among all malignant breast lesions. The sensitivity and specificity of diagnosing benign cases clinically was 96.0% and 94.23% respectively while that for malignant cases was 94.23% and 96.0% respectively, and 95.4% accuracy for diagnosis of benign breast lesions and 92.6% for malignant breast lesion.

Conclusion: In the present study, the most common non neoplastic lesion was mastitis with 52.1% incidence, *benign lesion was fibroadenoma with 65.6% incidence* and the most common *malignant lesion was infiltrating duct carcinoma with 86.5% incidence*. The peak incidence of benign lesions was in the age group of <20–30 years, and the maximum percentage of malignancy was seen in 61-70 years age group.

Keywords: Histopathology; Breast Malignancy; Benign Breast Disease; Clinico-Pathological Study.

Introduction

Breast is a highly modified apocrine sweat gland composed of both epithelial and connective tissue element. A breast lump is a localized swelling, protuberance, bulge or bump in the breast tissue. It is a heterogenous group of disease and could be inflammatory or neoplastic(benign or malignant).

The spectrum of non neoplastic and benign breast lesions includes breast abscess, chronic mastitis, benign non proliferative lesions (fibrocystic change), benign proliferative lesions like sclerosing adenosis, adenomas, fibroadenoma and gynecomastia (in male). Malignant spectrum includes invasive duct carcinoma, invasive lobular carcinoma, mucinous carcinoma, medullary carcinoma, apocrine carcinoma, papillary carcinomas, salivary gland type

carcinoma, neuroendocrine neoplasms and epithelial-myoepithelial carcinomas etc.

Majority of the breast lesions initially present as a lump in the breast which is a very sensitive issue for both female and male patients. This is the main reason behind delay in reporting to the doctor for examination and further evaluation.

Histopathology plays an important role in the diagnosis of breast lesions. It is the main criteria that assesses the adequacy of treatment and is a necessary component in the diagnosis, treatment, and prognosis of breast diseases.

The main purpose of this study was to analyze and highlight the histopathological spectrum and prevalence of breast lesions at a tertiary care rural based hospital in central India. A timely and accurate diagnosis of a breast lump is crucial and early intervention alleviates anxiety and can be lifesaving.

Aim

This study aims to evaluate the frequency, age, gender, clinical correlation and histopathological diagnosis of breast lesions in a tertiary care rural based hospital in central India.

Objective:

1. To analyze age and gender wise distribution of breast lesions.

2. To analyze histopathological types and frequencies of breast lesions.

3. To study clinical correlation of breast lesions.

Materials And Methods

Place and Duration of study:The study was conducted in the Department of Pathology, R.D Gardi Medical College, Ujjain, Madhya Pradesh, from January 2021 to September 2022.

Sample size: 177 cases

Study design: Retrospective study

Inclusion criteria: All trucut biopsies, lumpectomy/ excisional biopsy and MRM specimens received for histopathological examination, suspected for neoplastic and non-neoplastic lesions of the breast during the study period were included in the study.

Exclusion criteria: Those who had been treated for malignancy earlier were excluded from the study.

Among the 177 specimens, most of them were trucut biopsy specimens, MRM specimen and few were lumpectomy specimens.

The clinical presentation, sonogram/ mammogram, fine-needle aspiration cytology (FNAC) and other relevant information were obtained from the hospital management and laboratory information system.

The clinical details were recorded as per the proforma along with imaging findings and related special investigations were taken into consideration.

The histopathological features were noted, and the tumors were diagnosed based on the WHO classification and graded adopting modified Bloom–Richardson grading system.

Result

1. A total of 177 breast lesions were analyzed.
2. One hundred and twenty five (70.6%) of these were non neoplastic and benign breast lesions while fifty two (29.4%) were malignant neoplasms.
3. Mastitis was the most common with 12(52.1%) cases among all non neoplastic breast lesions.
4. Fibroadenoma was the most common with 82(65.6%) cases among all benign breast lesions.
5. Invasive duct carcinoma was the most with 45 (86.5%) cases among all malignant breast lesions.
6. Breast cancer was found with highest incidence rate (100%) in seventh decade.
7. Among all (11) breast lesions in males, 10(90.9%) cases were diagnosed as Gynecomastia and 1(9.1%) case was diagnosed malignant.
8. The sensitivity and specificity of diagnosing benign cases clinically was 96.0% and 94.23% respectively while that for malignant cases was 94.23% and 96.0% respectively.

Table no. 1: Gender Distribution in study group

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GENDER	NUMBER	PERCENT (%)
FEMALE	166	93.8
MALE	11	6.2
TOTAL	177	100

Table no. 2: Distribution of breast lesions Gender wise in the study group

GENDER	FEMALE	MALE	T0TAL
NON NEOPLASTIC OR BENIGN	115	10	125
MALIGNANT	51	01	52
TOTAL	166	11	177

Table 3: Prevalence of benign and malignant breast lesions according to age

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Age of patients (in years)	No of patients	Benign and malignant cases
<20	40	All benign
21-30	46	44 Benign 02 Malignant
31-40	37	26 Benign 11 Malignant
41-50	24	07 Benign 17 Malignant
51-60	21	07 Benign 14 Malignant
61-70	06	00 Benign 06 Malignant
>71	03	01 Benign 02 Malignant

Table 4 : Histopathological types and frequency of occurrence of non neoplastic and benign breast lesions

Histopathological diagnosis	Number of cases, n=125	Percentage of all non neoplastic+benign breast lesions(%) , n=125	Percentage in all non neoplastic+ benign+premalignant +malignant lesions (%), n=177
Non Neoplastic Lesions (n=23)			
Granulomatous mastitis	12	9.6	6.7
Fibrocystic change	08	6.4	4.5
Duct ectasia	02	1.6	1.1
Galactocele	01	0.8	0.5

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Benign breast lesions (n=102)			
Fibroadenoma	82	65.6	46.3
Fibroadenosis	06	4.8	3.3
Gynaecomastia	11	8.8	6.2
Intraductal Papilloma	01	0.8	0.5
Tubular adenoma	01	0.8	0.5
Adenomyoepithelioma	01	0.8	0.5

Table 5 : Histopathological types and frequency of occurrence of Pre malignant and malignant breast lesions

Histopathological diagnosis	Number of cases, n=52	Percentage in premalignant + malignant breast lesions(%), n=52	Percentage in all non neoplastic+ benign+premalignant +malignant lesions (%), n=177
Carcinoma in situ , n=1			
DCIS with Paget's disease	1	1.9	0.5
Lobular carcinoma in situ	0	00	00
Invasive carcinoma , n=51			
Invasive Duct Carcinoma (IDC)	45	86.5	25.4
IDC with Paget's Disease of nipple	1	1.9	0.5
Solid papillary carcinoma with invasion	1	1.9	0.5
Metaplastic carcinoma	2	3.8	1.1
Invasive carcinoma with neuroendocrine features	1	1.9	0.5
Invasive lobular carcinoma	1	1.9	0.5

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Table no. 6 : Incidence of Malignant breast lesions according to age groups

Age of patients (in years)	Total number of patients	Diagnosed as malignant cases	Percent of malignant cases (%)
<20	40	00	00
21-30	46	02	4.3
31-40	37	11	29.7
41-50	24	17	70.8
51-60	21	14	66.6
61-70	06	06	100
>71	03	02	66.6

Table no. 7 : Sensitivity, Specificity and Accuracy of clinical diagnosis in diagnosing Benign lesion

	Histopathological Diagnosis		
Clinical Diagnosis	Benign and Non-Neoplastic Lesion	Malignancy	Total
Benign and Non-Neoplastic Lesion	120	3	123
Malignancy	05	49	54
Total	125	52	177

Sensitivity	**96.0%**
Specificity	94.2%
Accuracy	95.4%

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Table no. 8 : Sensitivity, Specificity and Accuracy of clinical diagnosis in diagnosing Malignancy

	Histopathological Diagnosis		
Clinical Diagnosis	Malignant breast Lesions	Non-Neoplastic and Benign breast lesions	Total
Malignancy	49	05	54
Non-Neoplastic and Benign Lesion	3	120	123
Total	52	125	177

Sensitivity	**94.23%**
Specificity	96.0%
Accuracy	92.66 %

Figure 1 :(a)Fibroadenoma (b) Invasive duct carcinoma

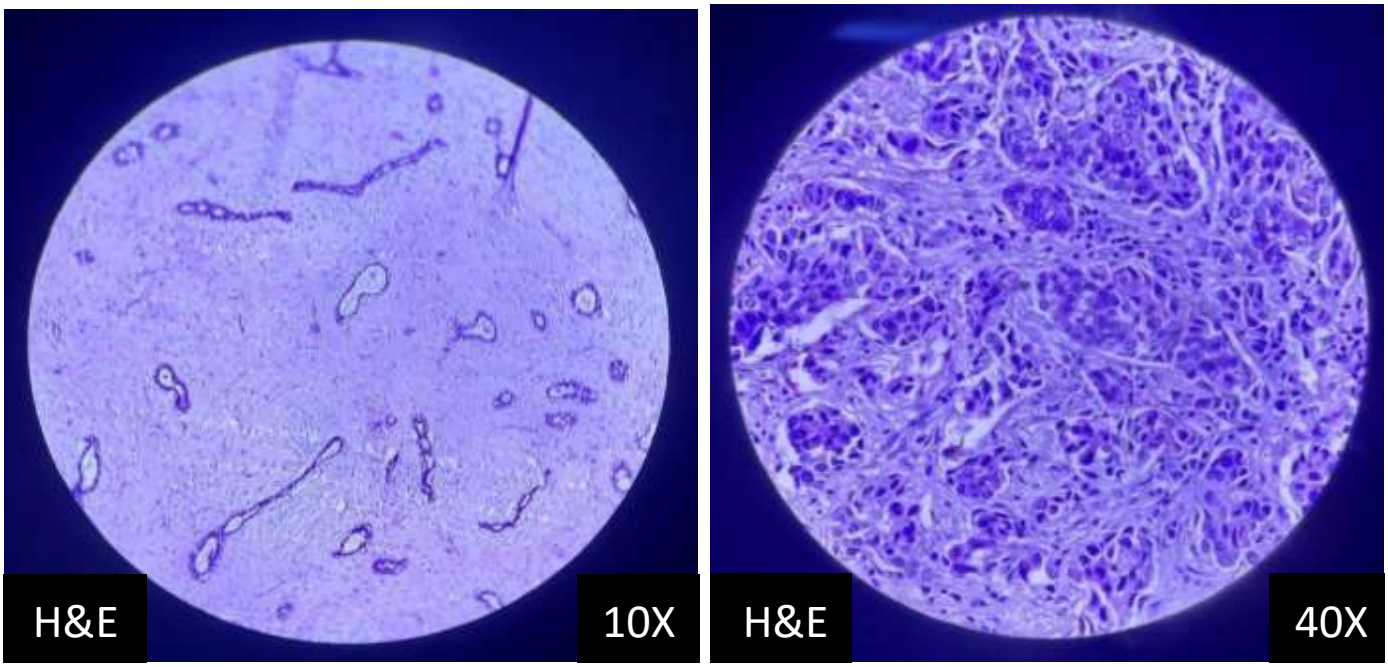

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Figure 2 :(a) Gross picture of breast tru cut biopsy. (b) Microscopic picture showing sheets and nest of neoplastic ductal cells with severe pleomorphism, many cells shows multinucleation (IDC Grade 3) in a case of tru cut biopsy from male breast.

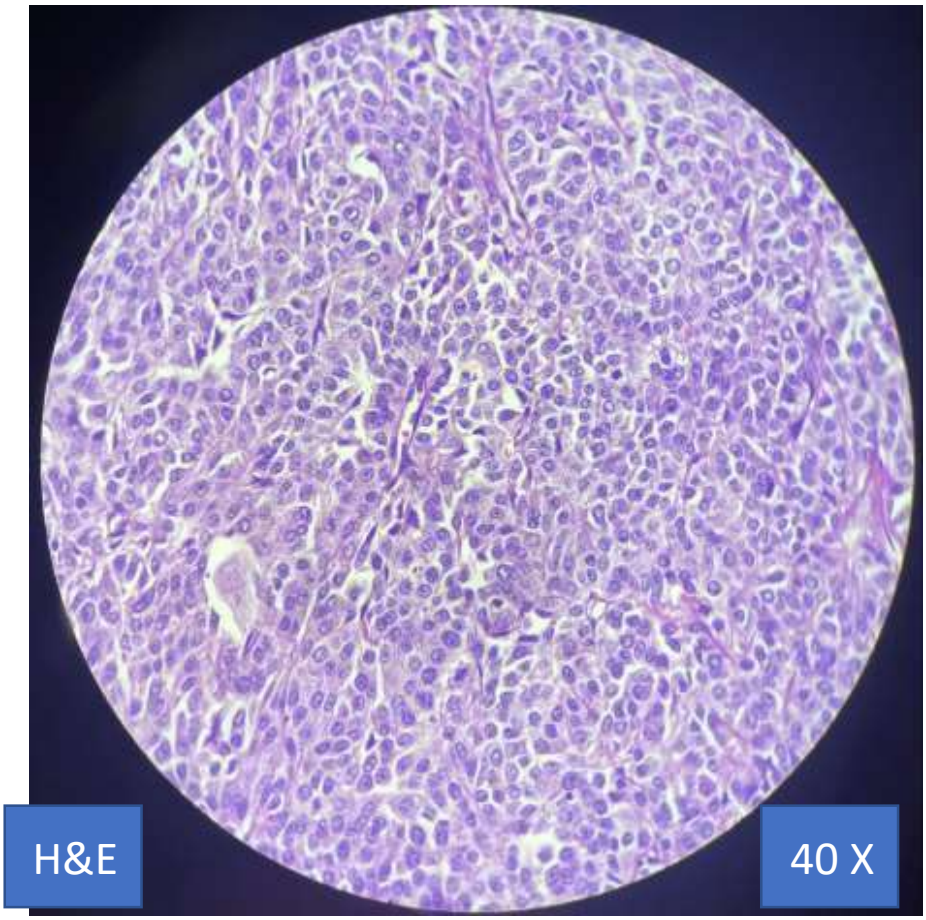

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Figure 3:Microscopic picture (a) showing features of Invasive Duct Carcinoma with neuroendocrine features.

Table 9: Comparison with other studies

STUDY	PLACE	YEAR	SAMPLE SIZE	COMMONEST BENIGN BREAST LESION	AGE GROUP (Years)	COMMONEST MALIGNANT BREAST LESION	AGE GROUP (Years)
S. Yogalakshmi, M. Kavitha	Coimbatore Tamil Nadu, India	2018	120	**Fibroadenoma (46%)**	21-30	**Infiltrating duct carcinoma (77%)**	41-50
Shalini Kashyap1 , Sachin Chauhan	Israna, Panipat India	2020	150	**Fibroadenoma (44.1%)**	30-50	**Infiltrating duct carcinoma (80%)**	30-50
Jadhav Dnyaneshwar S, Kale Priyanka B, Giri Apoorv, Valand Arvind G.	Ambajogai, Maharashtra India	2015	274	**Fibroadenoma (73.7%)**	15-30	**Infiltrating duct Carcinoma (82.5%)**	41-50
PRESENT STUDY	Ujjain Madhya Pradesh, India	2022	177	**Fibroadenoma (65.6%)**	15-30	**Infiltrating duct Carcinoma (86.5%)**	30-75

Discussion

The breast tissue is composed of specialized epithelium and stroma that is capable of giving rise to benign or malignant lesions.

The benign spectrum of breast lesions includes fibroadenoma, fibroadenosis, benign phyllodes tumor, mastitis, duct papilloma, tubular adenoma, sclerosing adenosis, Adenomyoepithelioma and breast abscess and the malignant spectrum includes duct carcinoma and its variants, lobular carcinoma and metaplastic carcinoma.

Breast lesions show a female predominance when compared to males and the histopathological spectrum of breast lesions varies among different age groups, countries and ethnic group. In general, benign breast lesions are more common than malignant breast lesions.

The risk factors for breast lesions include nulliparity, higher age at first childbirth, late menopause,

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hormone replacement therapy and they all highlight the fact towards excessive exposure of breast parenchyma to circulating estrogen.

Conclusion

In the present study, the most common benign lesion was fibroadenoma with a 65.6% incidence and the most common malignant lesion was Infiltrating duct carcinoma, 86.5%.

The peak incidence of benign lesions was found in the age group of <20–30 years, and the peak incidence of malignancy was seen in 61-70 years.

Biopsy tissue submitted of patients above 60 years of age are less but prevalence of malignancy is much more.

Infiltrating duct carcinoma was the commonest malignancy diagnosed.

The sensitivity and specificity of diagnosing benign cases clinically was 92.0% and 94.23% respectively while that for malignant cases was 94.23% and 92.0% respectively

There was 95.4% and 92.6% accuracy of clinical diagnosis with histopathology diagnosis for non neoplastic, benign and malignant breast lesions respectively. On the other hand, 05 cases diagnosed as malignant clinically turned out to be benign on histopathology and 03 lesions clinically diagnosed as benign were found to be malignant on histopathology.

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