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A Histopathological Study of Neoplastic and Non-Neoplastic Breast Lesions at a Rural Tertiary Care Centre in India

Jadhav Dnyaneshwar S.*, Kale Priyanka B., Giri Apoorv**, Valand Arvind G.*****

*Associate Professor, **Assistant Professor, ***Professor and Head, Department of Pathology, SRTR Govt Medical College, Ambajogai, Maharashtra, India.

Abstract

Although clinical and radiographic examination for breast lesions have come to play an important role in the assessment of the malignant potential of a lesion involving the breast, histopathology remains the gold standard in this regard, not only for its diagnostic role but also due to its prognostic implications and as guide to further management. The present prospective observational study was conducted at a rural medical college over 2 years from September 2013 to August 2015 in which 274 cases of breast lesions were assessed and correlation was done between clinic-radiological and histological diagnoses. 67.88% of the lesons were benign neoplasms while 28.46% were malignant. Clinico-radiological features were found to have 93.84% sensitivity and 93.58% specificity for identifying benign lesions; the sensitivity for malignancies was 93.58% while the specificity was 93.84%.

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

Introduction

Breast tissue is well developed only in female; in men it remains rudimentary throughout the life [1]. Breast is a superficially located organ subject to many changes during a woman's life and sensitive to hormones particularly estrogen and progesterone. Benign neoplasms of the breast are more common than the malignant neoplasms and are completely curable. However, these are overshadowed by the magnitude of the problems of malignant tumors of the breast. More than half of all women will develop some form of benign breast disease (BBD) after age 20. Although a history of BBD indicates some increase in risk for breast cancer (BC), only a small fraction of those diagnosed ever develop malignant disease [2]. According to Indian Council of Medical Research statistics, 10,000 breast cancers are being diagnosed every year in India and more than 70% of them are diagnosed in advanced stage. By 2020, the incidence of breast cancer in India is expected to double. This study was conducted with the purpose of appreciating the histo-morphology of neoplastic benign and malignant lesions as well as non-neoplastic lesions, their age distribution and clinical aspects, from biopsy specimens, lumpectomy and modified radical mastectomy specimens.

Corresponding Author: Dnyaneshwar S. Jadhav, Associate Professor, Department of Pathology, SRTR Govt Medical College, Ambajogai, District – Beed, Maharashtra 431517, India.

E-mail: drdsjjadhav@rediffmail.com

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Subjects and Methods

The present prospective study was carried out in the department of pathology, SRTR Rural Medical College from September 2013 to August 2015. A total of 274 patients of all ages and sexes, which presented with breast lumps, were included in the study. A working diagnosis was arrived at by analysis of history and clinical examination following which the lump was received for histopathological examination as biopsy, lumpectomy or MRM specimen in 10% formalin. The standard tissue processing protocols were followed and 5µ thick sections were cut and stained with hematoxylin and eosin for morphological analysis.

Results

In this study, age of the patients was ranged from (13 - 80 years), with mean age of presentation being

36.71 years. In contrast to benign lesions which were seen in the 2nd to 4th decades of life malignancies occurred after the 5th decade (Table1). Of the 274 cases 266 were female and 8 were male. Involvement of left breast (51.83%) was more than right (47.08 %) whereas 1.09% cases presented with bilateral breast lesions. Majority of the lesions were located in the upper outer quadrant (45%), followed by upper inner quadrant (13.63%). Whereas 7.58% of the lesions involved the breast diffusely, multiple quadrant of involvement was seen in 4.55% (Table2). All the patients in the study presented with the palpable breast lump, nipple retraction and discharge was seen in malignancies only and comprised of 2.19% and 0.7% of the patients respectively.

Table 1: Age wise distribution of the inflammatory, benign and malignant breast lesions

Age wise distribution In years	No. of cases of inflammatory lesions	No. of cases of benign breast lesions.	No. of cases of malignant breast Lesions.
<10	0(0%)	0 (0%)	0 (0%)
11-20	0(0%)	26(13.97%)	0(0%)
21-30	3(30%)	98(52.68%)	1(1.28%)
31-40	3(30%)	47(25.26%)	5(6.41%)
41-50	2(20%)	13(6.9%)	26(33.33%)
51-60	1(10%)	2(1.07%)	31(39.74%)
61-70	1(10%)	0(0%)	11(14.10%)
71-80	0(0%)	0(0%)	4(5.12%)
Total	10(100%)	186(100%)	78(100%)

Table 2: Frequency of occurrence of breast lesions in different quadrants of the breast

Sr. No.	Quadrant	Number of cases	Percentage (%)
1	Upper outer	125	45%
2	Upper inner	36	13.63%
3	Lower outer	33	12.12%
4	Lower inner	19	6.97%
5	Central	27	9.70%
6	Multiple quadrant	13	4.55%
7	Diffuse	21	7.58%
	Total	274	100%

Table 3: Typing and frequency of occurrence of different inflammatory lesions on histopathology

Category	Diagnosis	No of Cases	%of inflammatory lesions	% of all Lesions
Inflammatory	Acute mastitis/abscess	4	40%	1.46%
	Chronic non-specific Mastitis	1	10%	0.36%
	Fat necrosis	1	10%	0.36%
	Ductal ectasia	2	20%	0.72%
	Granulomatous mastitis	1	10%	0.36%
	Plasma cell mastitis	1	10%	0.36%
	Total	10	100%	3.64%

Table 4: Typing and frequency of occurrence of different benign lesions on histopathology

Category	Diagnosis	No of Cases	% of benign	% of all Lesions
Benign nonneoplastic lesions				
Non proliferative	Fibrocystic Disease	15	8.07%	5.48%
breast diseases	Gynaecomastia	7	3.7%	2.55%
Proliferative	Ductal epithelial hyperplasia	1	0.5%	0.36%
breast disease with or without	Sclerosing adenosis	8	4.4%	2.91%
atypia	Lobular hyperplasia	1	0.5%	0.36%
	Fibroadenosis	5	2.6%	1.82%
	Pseudoangiomatous stromal hyperplasia	1	0.5%	0.36%
Benign neoplastic lesions				
Benign tumours	Fibroadenoma	137	73.7%	50%
	Tubular adenoma	4	2.16%	1.46%
	Lactating adenoma	2	1.07%	0.72%
	Phyllodes	5	2.6%	1.82%
	Total	186	100%	67.88%

Table 5: Histopathogical types and frequency of occurrence of malignant lesions of the breast

Type	No of cases	% of malignant cases	% of all lesions
Carcinoma in situ			
Ductal	2	2.56%	0.72%
Lobular	0	0%	0%
Invasive carcinoma			
Infiltrating(invasive) ductal Carcinoma	65	82.55%	23.86%
IDC with Paget's disease of nipple	3	3.84%	1.09%
Papillary carcinoma	1	1.28%	0.36%
Invasive lobular carcinoma	2	2.56%	0.72%
Medullary carcinoma	3	3.84%	1.09%
Mucinous carcinoma	1	1.28%	0.36%
Metaplastic carcinoma	1	1.28%	0.36%
Total	78	100%	28.46%

Table 6: Correlation of clinical diagnosis with histopathological diagnosis

Clinical Diagnosis	No. of Cases	Histopathological Diagnosis
Abscess	6	4 Acute abscess,1 Chronic mastitis,1 Infiltrating Ductal Carcinoma
Duct ectasia	1	1 Duct ectasia
Fibroadenoma	160	130 Fibroadenoma, 6 Fibrocystic disease, 5 Sclerosing adenosis, 4 Tubular adenoma, 3 each of Fibroadenosis, Phyllodes tumour, Infiltrating Ductal Carcinoma 2 Lactating adenoma, 1 each of Pseudoangiomatous stromal hyperplasia, Granulomatous mastitis, Ductal hyperplasia, Ductal carcinoma in situ.
Fibrocystic disease	12	6 Fibrocystic disease, 4 Fibroadenoma, 2 Fibroadenosis
Phyllodes	3	2 phyllodes, 1 Fibroadenoma
Gynaecomastia	7	7 Gynaecomastia
Paget's disease	1	1 Paget's disease
Carcinoma /Malignancy	84	61 Infiltrating Ductal Carcinoma, 3 each of Medullary carcinoma, Fibrocystic disease, Sclerosing adenosis. 2 each of Invasive lobular carcinoma, IDC with Paget's disease, Fibroadenoma 1 each of Ductal carcinoma in situ, Mucinous carcinoma, Metaplastic carcinoma, papillary carcinoma, Lobular hyperplasia, Plasma cell mastitis, Fat necrosis, Duct ectasia.

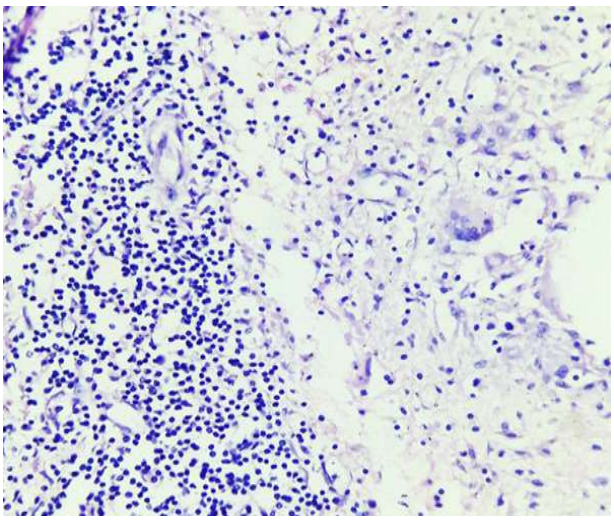

Fig. 1: Plasma cell mastitis: Microphotograph shows intense infiltrate of lymphocytes and plasma cells with a histiocytic giant cell. [H&E: 400X]

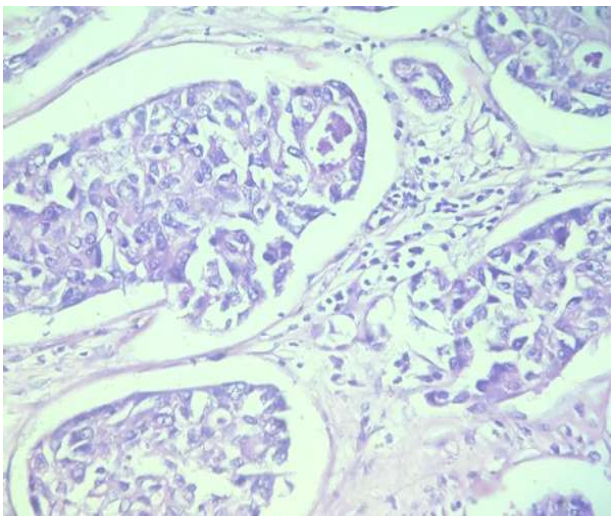

Fig. 2: Infiltrating ductal carcinoma: Microphotograph shows solid sheets of tumor cells with stromal invasion. [H&E: 400X]

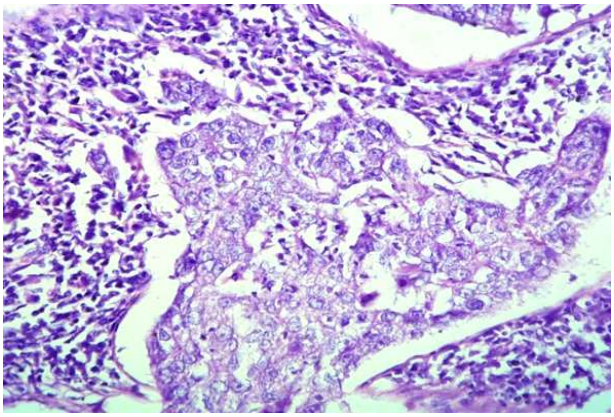

Fig. 3: Medullary carcinoma of breast: Microphotograph showing tumour cells in syncytium with pushing borders and surrounding lymphocytic infiltrate. [H&E: 400X]

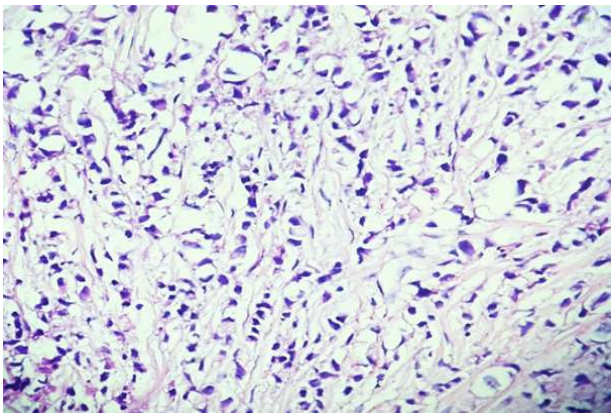

Fig. 4: Lobular carcinoma: Microphotograph showing Indian file arrangement of the tumour cells. [H&E: 400X]

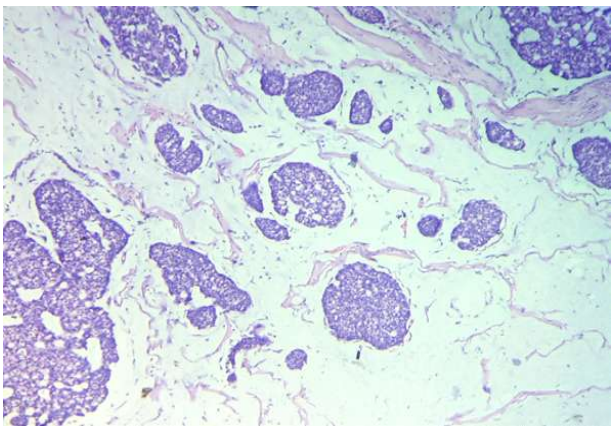

Fig. 5: Mucinous carcinoma of breast: Microphotograph showing small groups of tumor cells floating in the mucin pool. [H&E: 100X]

The lesions were histologically categorized as inflammatory, benign, and malignant; the benign category being further subdivided into benign non-neoplastic and neoplastic groups; individual composition of each bracket being 3.64%, 67.88% and 28.46% of all the lesions. The commonest inflammatory lesion found was acute mastitis/abscess (Table3). Fibrocystic disease was most common benign non-proliferative lesion while sclerosing adenosis and fibroadenosis were the commonest proliferative lesions. Fibroadenoma was commonest neoplastic lesion overall (Table 4) whereas invasive ductal carcinoma (NOS) was the commonest malignant counterpart (Table 5). The final histological diagnoses were correlated with those made on clinical grounds and sensitivity and specificity of clinical diagnoses were obtained (Table 6). The sensitivity and specificity of diagnosing benign cases clinically was 93.84% and 93.58% respectively while that for malignant cases was 93.58% and 93.84% respectively.

Discussion

Proportion of male cases in various studies ranged from 4% to 8% [3-7]; in our study it was 2.91%. Female proportion in various studies varies from 91.85% to 98.26% [3-7]; in this study it was 97.08% which well correlated with other similar studies. High proportion of the female cases shows that breast diseases are more common in female than male.

Most of the inflammatory lesions are found in reproductive age group; in this study maximum inflammatory lesions i.e. 30% of cases were present in each 21-30 and 31-40 years age group, while Godwins et al (2011) [8] and Kanchana et al (2015) [9] reported majority cases i.e. 37.04% and 27.27% in 41-50 years age group respectively.

Most of the benign lesions are found in reproductive age group; in our study maximum benign lesion i.e. 51.53% of cases were present in 21-30 years age group, Ibrahim et al (2015) [10] also reported similar i.e. 41.73% of the benign lesion cases in this age group. While Mudholkar et al (2012) [11] reported maximum 37% of cases in 11-20 years age group. The next common age group involved in our study was 31-40 years; we reported 25.51% of benign cases in this age group which was comparable with 27% cases reported by Mudholkar et al (2012) [11] and 23.28% reported by Ibrahim et al (2015) [10].

Most of the malignant lesions cases are found after the 40 years of age. The present study reported 73% of the malignant lesions in the 6th and 7th decades of life which was comparable to the 70% of breast malignancies reported by Malik R et al (2003) [12]. Mudholkar et al (2012) [11] and Ibrahim et al (2015) [10] reported 48% and 31% of the malignant cases in this age group.

The present study found left breast involvement to be more common than right (51.83%); this observation

agreed with that of the other authors [13-16]. Furthermore, the upper outer quadrant of the breast has been recognized as the most frequently involved area by breast lesions; the observations in the present study (45%) concurred with those reported previously [11, 15-17].

All patients in the present study showed up for investigation after they noticed the lump. Similar findings were recorded by Vijayabharathi et al (2015) [7], Sandhu et al (2010) [11] and Aslam et al (2013) [6].

On histopathology, the present study recorded 82.48% of the lesions as neoplastic which was comparable to the study done by Bajaj et al (2013) [18] who reported it in 76.9% of the cases. 17.52% lesions were categorized as nonneoplastic in this study which was also comparable to the study done by Bajaj et al (2013) [18] i.e. 23.1%.

Benign breast lesions were most common in the present study at 67.88% of all lesions, a finding comparable to that of, Hussain et al (2005) [19], Aslam et al (2013) [6], Rathi et al (2015) [16] and Kanchana et al (2015) [9] who reported 54.08%, 79.13%, 78.68%, 76.96% of the benign lesions cases respectively. The finding of 28.46% of the lesions as malignant on histopathology agreed with the study done by Hussain et al (2005) [19] who reported it in 24.10% of the cases.

We reported 3.64% cases in inflammatory lesions, which is comparable to the study done by Rathi et al (2015) [16], and is slightly less than other studies done by other authors.

The present study noted the frequency of occurrence of fibroadenoma to be 73.7% of all benign lesions which was similar to that reported by Aslam et al (2013) [6] and Dayanand et al (2015) [20] i.e. 71.3% and 62.4% respectively.

Fibrocystic disease was next common lesion in all studies. Godwins et al (2011) [8], Dayanand et al (2015) [20] and Ibrahim et al (2015) [10] reported in 31.8%, and 16.2% and 25.4% of all other benign lesions. The present study recorded it as 8.07% of benign cases.

Sclerosing adenosis is considered as proliferative disease without atypia and carries slightly increased risk of malignancy, we reported in 4.4% of the cases. Ibrahim et al (2015) [10] also reported it in nearly similar incidence i.e. 3.3% of all the benign cases.

The present study recorded a lower occurrence of phyllodes tumour at 2.6% of all benign lesions, as compared to Dayanand et al (2015) [20] and Ibrahim et al (2015) [10] who reported it in 7.6% and 4.8% of the benign cases respectively.

The occurrence of infiltrating duct carcinoma in the present study was 82.55% of malignant lesions, which was comparable with the frequencies recorded by Mudholkar et al (2012) [11], Dayanand et al (2015) [20] and Ibrahim et al (2015) [10] at 88%, 85.5% and 59.5% of malignant lesions respectively.

Invasive lobular carcinoma accounted for 2.56% of malignancies in this study; Mudholkar et al (2012) [11] reported it in only 0.75% of the malignant cases while Dayanand et al (2015) [20] and Ibrahim et al (2015) [10] reported it in comparatively more number of cases i.e. 5.1% and 6.9% respectively.

Medullary carcinoma was seen in 3.84% of malignancies in the present study; nearly similar frequency was reported by Dayanand et al (2015) [20] in 4.8% of the malignant cases.

There was 81.25% correlation for fibroadenoma and 85.71% correlation for carcinoma/malignancy. 7 cases of gynecomastia, 6 cases of fibrocystic disease, 4 cases of abscess, 2 cases of phyllodes and 1 case of Paget's disease also correlated well.

Considering histological diagnosis as the gold standard, we found that the sensitivity and specificity of clinical diagnosis to detect a benign case was 93.87% and 93.58%, respectively, and the sensitivity and specificity to detect a malignant case on clinical diagnosis was found to be 93.58% and 93.87%, respectively.

Similar study was done by Rathi et al (2015) [16], and have found similar results with high sensitivity and specificity of clinical diagnosis. They found that the sensitivity and specificity of clinical diagnosis to detect a benign case was 100% and 95.45%, respectively. Also the sensitivity and specificity to detect a malignant case on clinical examination was found to be 95.23% and 100%, respectively.

Conclusion

Breast samples made 5.51% of total histopathology samples received during study period. The present study found that inflammatory lesions were most common in the 3rd and 4th decade of life and acute mastitis/abscess was the commonest lesion in this category. Benign lesions were most common lesions seen overall and tended to occur in the 3rd decade of life with fibroadenoma being the commonest lesion. Increasing risk for malignancy was seen with increasing age; most lesions occurred in 6th and 7th decades of life. Among the malignant lesions infiltrating ductal carcinoma was the most common

tumour diagnosed on histopathology. There was 81.25% correlation of clinical diagnosis with histopathology for fibroadenoma and 85.71% correlation for carcinoma. On the other hand, 12 cases diagnosed as malignant clinically turned out to be benign on histopathology and 5 lesions clinically diagnosed as benign were found to be malignant on histopathology.

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