



HISTOPATHOLOGICAL STUDY OF NEOPLASTIC BREAST LESIONS IN A TERTIARY CARE CENTRE.

Pathology

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ABSTRACT

We have studied 194 cases of neoplastic breast lesions over a period of 2 years (1 Jan 2020 to 31 December 2021) in MGM Medical college and Hospital, Aurangabad. The specimens were received in histopathology section of pathology department. Specimens were received in different forms such as Lumpectomy, trucut biopsy, simple mastectomy and MRM. Detailed gross examination of specimens (grossing of MRM: - according to AJCC protocol) followed by fixation, thorough sampling and tissue processing. The different lesions were studied by histopathological examination and analysed. Neoplastic lesions were classified according to WHO classification (2017). Out of 194 cases, 75 cases had benign breast tumours and 119 had malignant tumours. Fibroadenoma (68 cases) was most common benign tumour followed by benign phyllodes (4 cases), lactating adenoma (2 cases) and multiple ductal papilloma (1 case). Invasive carcinoma with no special type (104 cases) was most common malignant tumour. Special subtypes of invasive carcinoma found in our study were:- Invasive metaplastic carcinoma (1 case) Invasive lobular carcinomas (2 cases), Invasive papillary carcinoma (1 case), Invasive mucinous adenocarcinoma (1 case), Solid papillary carcinoma (1 case), Invasive carcinoma with mucinous component (1 case), Invasive carcinoma with neuroendocrine features (1 case) and Intracystic papillary carcinoma (2 cases). Other malignant tumours included malignant phyllodes (2 cases) and malignant spindle cell neoplasm (3 cases). In our study, we found that malignant neoplasms were more common than benign neoplasms with Invasive breast carcinoma with no special type being the commonest malignant tumour. Histopathological study plays an important role in diagnosis of breast neoplasms and hence in treatment and prognosis.

KEYWORDS

Neoplastic lesion, Fibroadenoma, Invasive carcinoma

INTRODUCTION

Breast lesions are heterogeneous group of diseases with remarkably different characteristic features. Most of the breast lesions are well studied and diagnosed while some of the unusual lesions and malignancies are still less elaborated. Majority of the breast lesions initially may present with a lump in the breast. This is very sensitive for female patients to report to doctor for an examination because of hesitation¹. As timely diagnosis of a breast lump is crucial and early intervention decreases anxiety, its timely reporting should be encouraged. Recently breast lesions have gained increased attention due to its increased morbidity. Hence more awareness is being spread amongst women about breast lumps¹. Previous studies conducted on the spectrum of breast lesions stated that it varies among various countries and ethnic groups. Common causes of breast masses include fibrocystic changes, fibroadenomas, breast infection, galactocele, and breast cancer. Majority of the breast lesions are benign². The spectrum of benign breast lesions includes fibroadenoma, phyllodes tumor, gynecomastia, breast abscess, and chronic mastitis. Special focus should be given to findings of breast lesions such as hard mass that is fixed and irregular in shape and firmly attached to the surrounding tissues. Malignant lesions account for 10 % of the breast masses³. As per WHO (2008) malignant breast lesions comprise 1.38 million cases.[3] Breast malignancy is the second most common malignancy in women after carcinoma cervix and is diagnosed in 20 out of 100,000 women^{4,5}. Spectrum of malignant breast lesions includes ductal carcinoma, lobular carcinoma, colloid carcinoma, and medullary carcinoma.

Treatment of breast masses depends on the underlying cause including simple pain medication to surgical removal⁶. Some cases might resolve without treatment. Incidence of benign breast lesions begins during the 2nd decade of life and increases gradually in the 4th and 5th decades whereas incidence of malignant lesions increases after menopause⁷.

Histopathology plays an important role in diagnosis of breast lesions which further helps in adequacy of treatment. Histopathology is necessary in the diagnosis, treatment, and prognosis of breast diseases⁸. With this perspective present study was undertaken with an objective to analyse histopathological spectrum and prevalence of breast lesions.

MATERIAL AND METHOD

Institutional ethics committee permission was taken prior to commencement of present study. 194 cases of breast lesions were studied over a period of 2 years from 1 January 2020 to 31 December 2021.

Inclusion criteria

All specimens in different forms like excisional biopsy, trucut biopsy, simple mastectomy and modified radical mastectomy received for histopathological examination at our institute suspected for neoplastic and non-neoplastic lesions of the breast during the study period were included in the study.

Procedure

Specimens were received in histopathology section of our department in different forms as excisional biopsy, trucut biopsy, simple mastectomy and modified radical mastectomy (MRM). Detailed gross examination of specimens (grossing of MRM: - according to AJCC protocol) followed by fixation, thorough sampling and tissue processing were carried out.

Biopsy specimens were processed completely. In MRM specimens, After fixation, representative tissue bits were taken from tumor proper, nipple and areola, deep surgical margin, adjacent breast and lymph nodes if available. The tissue bits were processed to make paraffin blocks. The sections were cut at 3-4 micron thickness and were stained

with Hematoxylin and Eosin. Microscopic examination was done.

Operational definition

1. Neoplastic lesions were classified according to WHO classification (2017) and were analyzed according to age distribution, quadrant involvement, nature of specimen, and histopathology.
2. Invasive breast carcinoma was graded according to Nottingham modification of Bloom–Richardson grading system

RESULT:-

Result obtained in present study showed maximum patients were from the age group 41 to 50 with 48 (25 %) cases and 51 to 60 with 39 (20 %) cases (**Table 1**). In majority of patient's location of lesion was upper outer found in 45 (86.53%) cases (**Table 2**). Cases diagnosed as benign were 75 (39 %) and as malignant were 119 (61 %). Amongst benign fibroadenoma were the commonest, found in 68 (35 %) cases. Amongst malignant Invasive carcinoma of no special type were the commonest found in 104 (54 %) cases (**Table 3**).

In correlation of benign and malignant cases with age group, it was found benign cases were more amongst age group 11 to 20 whereas malignant were more in 41 to 50 and 51 to 60 (**Table 4**). Grading was done in 104 cases of invasive carcinoma (**Table 5**). Metastasis was found in 42 (80%) cases amongst total (**Table 6**).

Table 1: Age distribution

Sr No	Age group	No. of cases (N)	Percentage (%)
1	11 to 20	22	11 %
2	21 to 30	23	12 %
3	31 to 40	32	16 %
4	41 to 50	48	25 %
5	51 to 60	39	20 %
6	61 to 70	20	10 %
7	>70	10	6 %
Total N (%)		194	100 %

Table 2: Location Of Lesion Distribution In MRM Specimens

Sr No	Location of lesion	No. of cases (N)	Percentage (%)
1	Upper Outer	45	86%
2	Upper Inner	2	4%
3	Lower Outer	3	6%
4	Lower Inner	0	0%
5	Central	2	4%
Total N (%)		52	100 %

Table 3: Type of lesion distribution

CATEGORY	DIAGNOSIS	No. of cases (N)	Percentage (%)
BENIGN (75)	1.Fibroadenoma	68	35.05 %
	2. Benign phyllodes	4	2.06 %
	3. Lactating adenoma	2	1.03 %
	4.Multiple ductal papilloma	1	0.51 %
MALIGNANT (119)	1. Invasive carcinoma of no special type	104	53.60 %
	2. Metaplastic carcinoma	1	0.51 %
	3. Invasive lobular carcinoma	2	1.03 %
	4. Invasive papillary carcinoma	1	0.51 %
	5. Invasive mucinous adenocarcinoma	1	0.51 %
	6. Solid papillary carcinoma	1	0.51 %
	7.Invasive Ca with mucinous component	1	0.51 %
	8.Invasive Ca with neuroendocrine features	1	0.51 %
	9.Intracystic papillary carcinoma	2	1.03 %
	10.Malignant phyllodes	2	1.03 %
	11.Malignant spindle cell neoplasm	3	1.54 %
Total N (%)		194	100 %

Table 4: Diagnosis and age correlation

Category	DIAGNOSIS	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	>70	Total
BENIGN	Fibroadenoma	21	16	13	13	2	3	0	68
	Benign phyllodes	0	2	0	2	0	0	0	4
	Lactating adenoma	0	2	0	0	0	0	0	2
	Multiple ductal papilloma	0	0	1	0	0	0	0	1

MALIGNANT	Invasive carcinoma of no special type	1	2	15	30	34	16	6	104
	Metaplastic carcinoma	0	0	1	0	0	0	0	1
	Invasive lobular carcinoma	0	0	0	0	1	1	0	2
	Invasive papillary carcinoma	0	0	0	1	0	0	0	1
	Invasive mucinous adenocarcinoma	0	0	0	0	0	0	1	1
	Solid papillary carcinoma	0	0	0	0	0	0	1	1
	Invasive Ca with mucinous component	0	0	0	0	0	0	1	1
	Invasive Ca with neuroendocrine features	0	0	0	0	0	0	1	1
	Intracystic papillary carcinoma	0	0	1	0	1	0	0	2
	Malignant phyllodes	0	0	0	1	1	0	0	2
Total		22	23	32	48	39	20	10	194

Table 5: Grading distribution

Sr No	Grading	No. of cases	Percentage (%)
1	Grade I	2	2 %
2	Grade II	15	14 %
3	Grade III	83	84 %
Total N (%)		104	100 %

Table 6: Metastasis distribution in MRM specimens

Sr No	Metastasis	No. of cases	Percentage (%)
1	Present	42	80%
2	Absent	10	20%
Total N (%)		52	100 %

DISCUSSION

Present cross-sectional study was conducted in department of pathology at tertiary care hospital between period 1 January 2020 to 31 December 2021. Total 194 specimens received in histopathology section of our department in different forms as excisional biopsy, trucut biopsy, simple mastectomy and modified radical mastectomy were studied. Detailed gross examination of specimens according to AJCC protocol were done. This is followed by fixation, thorough sampling and tissue processing. Microscopic examination was done. Result obtained showed maximum patients in the age group 41 to 50 with 48 (25 %) cases and 51 to 60 with 39 (20 %) cases. In our study, majority of patient's location of lesion was upper outer found in 45 (86%) cases.

Cases diagnosed as benign were 75 (39 %) and as malignant were 119 (61 %). Amongst benign fibroadenoma were the commonest, found in 68 (35 %) cases. Table no. 7 shows the observations of different other authors who studied benign tumours of breast. Fibroadenomas had the highest frequency among the benign breast tumors in all the studies. Amongst malignant neoplasms, Invasive carcinoma of no special type were the commonest found in 104 (54 %) cases. The frequency distribution of histological types of malignant breast tumors noted by different authors is shown in table no. 8.

In all the studies, invasive carcinoma, no special type was the most common malignant neoplasm. 104 cases of malignant breast tumours were graded according to Nottingham modification of Bloom –Richardson grading system. The observations of present study and other studies are shown in table no. 9.

In our study grade III was most common grade, while In all other studies, grade II invasive breast carcinoma was the most common. Benign cases were more amongst age group 11 to 20 whereas malignant were more in 41 to 50 and 51 to 60. Metastasis was found in 42 (80%) cases amongst total MRM specimens.

Table No-7: Showing Frequency distribution of various benign breast tumours.

SR.no	AUTHOR S	SIDDIQ UI ET AL 13	OLU-EDDO ET AL16	MUDH OKAR ET AL9	SULHL YAN ET AL 22	PRESE NT STUDY
	Total no. of benign tumors	645	944	127	76	75
1.	Fibroadenoma	556	803	111	60	68
		86.20%	85.06%	87.40%	78.94%	90.66%
2.	Benign phyllodes tumour	19	34	8	2	4
		2.94%	3.60%	6.29%	2.63%	5.30%
3.	Tubular adenoma	5	28	3	2	-
		0.77%	2.96%	2.36%	2.63%	-
4.	Lactating adenoma	5	36	-	-	2
		0.77%	2.96%	-	-	2.60%
5.	Duct papilloma	35	23	3	2	1
		5.42%	2.43%	2.5%	2.63%	1.33%
6.	Lipoma	10	15	1	1	-
		1.5%	1.56%	0.78%	1.31%	-
7.	Benign fibrous histiocytoma	2	-	-	1	-
		0.31%	-	-	1.31%	-

Table No-8: Showing Histological types of malignant breast tumors in different studies.

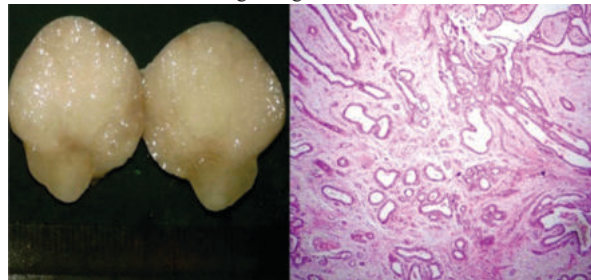
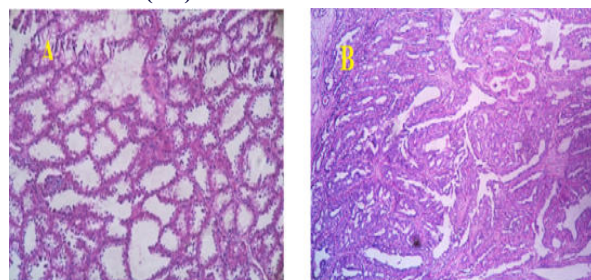
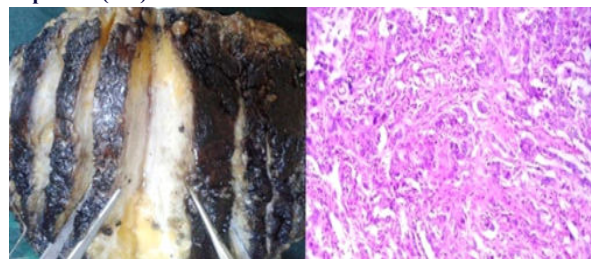
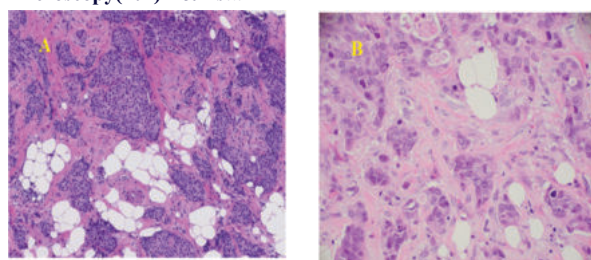
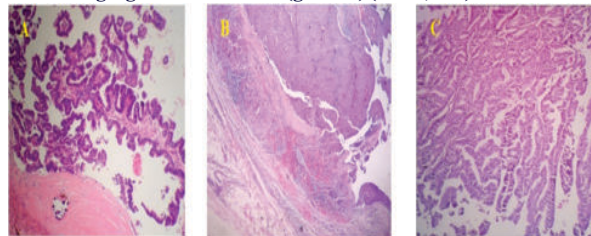
TYPE	Dauda et al18	Mudholkar et al9	Njeze et al20	Sulhlyan et al22	Present study
Total cases	165	125	28	53	119
Invasive carcinoma-No special type	78.8%	88%	53.6%	81.13%	87.39%
Invasive lobular carcinoma	6.7%	0.75%	-	-	1.68%
Medullary carcinoma	3.6%	0.75%	10.7%	-	-
Mucinous carcinoma	2.4%	1.5%	7.1%	1.88%	0.84%
Invasive papillary carcinoma	4.2%	0.75%	7.1%	-	0.84%
Metaplastic carcinoma	-	1.5%	-	5.66%	0.84%
Intracystic papillary carcinoma	-	0.75%	-	-	1.68%
Ductal carcinoma in situ with microinvasion	-	-	-	3.77%	-
Paget disease	-	-	-	1.88%	-
Anaplastic carcinoma	2.4%	-	-	-	-
Malignant phyllodes	1.8%	1.5%	-	-	1.68%

Table No-9: Showing histological grading of invasive breast carcinomas.

Sr. no.	Author	No. of cases in which grading was done	I	II	III
1.	Siddiqui et al13	975	11.38%	59.17%	29.47%
2.	Lee et al 20	736	23%	40%	36%
3.	Truong et al10	542	7.7%	49.6%	42.6%
4.	Vegt et al 21	242	23.5%	45.3%	30.9%
5.	Sulhlyan et al22	34	23.52%	70.58%	5.88%
6.	Present study	104	2%	24%	84%

Breast tissue is composed of specialized epithelium and stroma which is capable of turning into benign or malignant lesions. Human breast consists of 6 to 10 major duct systems. Overlying skin of breast is lined by keratinizing squamous epithelium which dips into the orifices of nipple and then abruptly changes to a double-layered cuboidal epithelium that continues to line the ducts. Larger ducts further branch and eventually lead to the terminal duct lobular unit. Two cell types line the ducts and lobules which are the luminal epithelial cells that overlay the epithelial cells. Benign spectrum of breast lesions includes fibroadenoma, phyllodes tumor, mastitis, and breast abscess.

Malignant spectrum includes ductal carcinoma, lobular carcinoma, tubular carcinoma, mucinous carcinoma, medullary carcinoma, papillary carcinoma, and metaplastic carcinoma. Breast lesions show a female predominance when compared to males¹³. In general, benign breast lesions are more common than malignant breast lesions. Risk factors for breast lesions include multiparity, low parity, low age at first childbirth, and late menopause, all these only highlight the fact toward excessive circulating estrogen^{14,15}.

**Fig 1: A) Gross picture of fibroadenoma B) Microscopy of Fibroadenoma (40x) H&E stain****Fig 2: A) Lactating Adenoma (10x) H&E stain B) Duct Papilloma (40x) H&E stain****Fig 3: Invasive breast carcinoma with no special type:- A) gross B) Microscopy (40x) H&E stain****Fig 4: A) Infiltrative, back to back nests of tumor cells with moderately enlarged nuclei (grade 2) (H&E, 10x). B) Infiltrative nests of high-grade Carcinoma (grade 3) (H&E, 40x)****Fig 5: A) Intracystic Papillary Carcinoma H&E stain (10x) B) Solid papillary carcinoma H&E stain (10x) C) Invasive papillary carcinoma H&E stain (10x)**

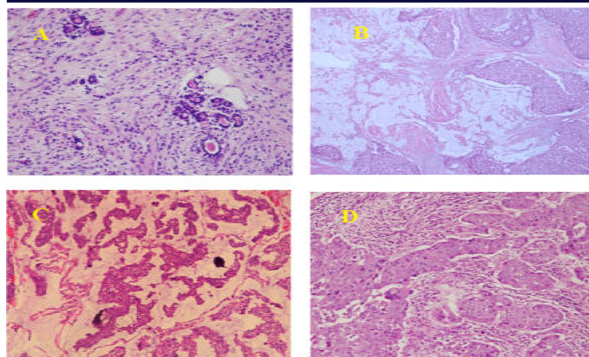


Fig 6: A) Invasive lobular carcinoma, H&E stain(10x) B) Mucinous carcinoma showing neuroendocrine differentiation, H&E stain(10x) C) Invasive mucinous adenocarcinoma, H&E stain(10x) D) Epithelial component consisting of moderately differentiated SCC and the mesenchymal component is a high grade sarcoma H&E stain(40x)

CONCLUSION:-

Amongst total 194 cases of breast lesions studied histopathologically majority tumors involved upper outer quadrant. Malignant neoplasms were more common than benign neoplasms. Fibroadenoma was the most common benign tumor and Invasive breast carcinoma with no special type being the commonest malignant tumor with grade 3. Histopathological study plays very important role in diagnosis of breast lesions and hence in treatment and prognosis.

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