

Spectrum of Breast Lesions: A Three-Year Retrospective StudyJyotirmaya Nayak¹, Sridhar Panda², Nilamadhaba Prusty³, Nagendra Kumar Rajsamant⁴¹Associate Professor, Department of General Surgery, SCB Medical College, Cuttack²Assistant Professor, Department of General Medicine, SCB Medical College, Cuttack³Assistant Professor, Department of ENT, FM MCH, Balasore⁴Assistant Professor, Department of General Surgery, SCB Medical College, Cuttack

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Corresponding author: Dr. Nagendra Kumar Rajsamant

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Abstract:

Introduction: Breast lesions are one of the most common surgical diseases seen in daily clinical practice. Both benign and malignant illnesses might provide diagnostic difficulties or be difficult to treat. The high death rate associated with breast cancer is connected to tumor aggressiveness, which is heavily influenced by histopathological kinds and stages.

Aim: The purpose of this study is to assess the prevalence of various breast lesions and to highlight the uncommon breast lesions observed in our research.

Materials and Methods: Our institution's Surgery department did a three-year retrospective analysis. A total of 348 breast specimens are being investigated. The sample size was determined by the study's convenience.

The results showed that 342 (98.28%) of the 348 specimens belonged to female patients, whereas 6 (1.72%) belonged to male patients. There were 254 non-malignant lesions, 92 malignant lesions (26.44%), and 2 borderline lesions (0.57%). Medullary carcinoma (3 instances), Paget's disease of the nipple (1 case), Metaplastic carcinoma (1 case), Clear cell carcinoma (1 case), and Mucinous carcinoma (1 case) were the subtypes observed.

Conclusion: The study of uncommon and underappreciated lesions, in addition to the normal lesions, is significant in today's period because it plays an important role in reducing morbidity and death related with breast lesions.

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Introduction

The breast is a diverse organ that is subject to hormonal changes throughout a woman's reproductive lifetime, enduring many morphological and physiological changes from puberty to menopause. Breast lesions are one of the most common surgical diseases seen in daily clinical practice. Breast cancer is the second most frequent malignancy in India, behind cervical cancer, and affects one in every 100,000 women. [1] Breast cancer is the main cause of illness and death in women globally, with just a few incidences documented in men.

Both benign and malignant illnesses might provide diagnostic difficulties or be difficult to treat. It is critical to differentiate between symptoms that need reassurance and supportive care and diseases that require decisive treatment. Diagnostic procedures such as mammography, ultrasonography, and fine-needle aspiration cytology are increasingly being employed for early diagnosis. The high death rate associated with breast cancer is connected to tumor

aggressiveness, which is heavily influenced by histopathological kinds and stages. [2]

The majority of tumors are formed from mammary ductal epithelium, namely the terminal duct lobular unit (TDLU), and up to 75% of infiltrating duct carcinoma, not otherwise specified (IDC-NOS) are detected. Invasive lobular carcinoma is the second most prevalent epithelial form, accounting for 5-15% of tumors.

However, there are many more varieties that are less prevalent but are still clearly described by the World Health Organization (WHO) classification.

Aim

This study is to evaluate the frequency of different breast lesions & to highlight the unusual breast lesions encountered in our study.

Materials and Methods

From August 2018 to July 2021, three-year retrospective research was undertaken at our

institution's Surgery department. A total of 348 breast specimens are being investigated. The sample size was determined by the study's convenience. During the research period, all mastectomy specimens, broad local excision specimens, and true cut biopsies from breast lesions were included. The Ethical Committee authorized the research, and informed permission was acquired. Women who had already been treated for cancer were excluded from the trial.

Among the 348 specimens, 256 (73.56%) were lumpectomy specimens, and 74 (21.26%) were mastectomy specimens. The remaining 18 specimens (5.18%) were core biopsy specimens. The histopathological registration form was used to get clinical data and examination results, magnetic resonance imaging (MRI), fine-needle aspiration cytology (FNAC), mammography findings, and other pertinent information. All breast specimens received at the Pathology department in various forms were processed according to normal procedure, and formalin fixed paraffin embedded tissue slices stained with haematoxylin and eosin were analyzed and appraised. The histological characteristics were documented, and the tumors were classified according to WHO [3]. The Nottingham variant of the Bloom-Richardson grading system was used to grade invasive breast cancer. Immunohistochemistry (ER, PR, HER2/neu) and special stains were used as needed and as resources allowed. During this examination, we discovered unusual and fascinating lesions that were thoroughly investigated. The need of descriptive study of all uncommon or unusual breast lesions is emphasized. The collected information was tabulated and analyzed.

Result

348 breast specimens were received across a three-year period, from August 2018 to July 2021. Their ages varied from 17 to 78. 342 (98.28%) of the total specimens were from female patients, whereas 6 (1.72%) were from male patients. The most prevalent presenting symptom in both benign and malignant groups was a lump in the breast.

In a tiny proportion of instances, other presenting symptoms were nipple discharge, discomfort, and fever. There were 254 (72.99%) non-malignant lesions, 92 (26.44%) malignant lesions, and 2 (0.57%) borderline lesions among the 348 total specimens. Table 1 depicts the spectrum of all histological lesions. There were 254 non-malignant lesions among the 348 patients, with 6 individuals having granulomatous mastitis and the rest 248 having benign neoplastic lesions. Fibroadenoma (174 instances) was the most prevalent benign neoplastic lesion, followed by fibrocystic disease (48 cases).

In our analysis, we discovered two examples of borderline phyllodes. A total of 92 malignant tumors were discovered. The majority of malignant breast tumors (85 cases) were Invasive Ductal Carcinoma-NOS. Medullary carcinoma (3 instances), Paget's disease of the nipple (1 case), Metaplastic carcinoma (1 case), Clear cell carcinoma (1 case), and Mucinous carcinoma (1 case) were the particular subtypes observed.

Discussion

This research assessed the clinical appearance and calculated the frequency and relative distribution of several breast lesions throughout the benign and malignant pathology spectrum. Breast lesions are usually more common in women than men, and the histological spectrum reflects this.

The prevalence of breast lesions varies by country and ethnic group [4]. The most prevalent predisposing factors for breast lesions include multiparity, low parity, young age at first delivery, and late menopause, all of which point to an increase in circulating oestrogen [5].

The most prevalent presenting symptom in both the benign and malignant groups in our investigation was a lump in the breast. In a tiny proportion of instances, other presenting symptoms were nipple discharge, discomfort, and fever. Other Indian investigations have described clinical presentations of their separate instances that are relatively similar [6, 7].

We saw a wide range of lesions, including benign and malignant tumors, as well as non-neoplastic lesions.

In the current research, 348 instances of breast lesions were included during a three-year period, with 346 (99.43%) being female breast lesions and only 02 (0.57%) being male breast lesions. Dharmakanta Kumbhakar et al. [8] discovered a similar finding. Benign and non-neoplastic lesions made up 254 (72.99%) of the cases, whereas malignant lesions made up 92 (26.44%) of the cases and 2 (0.57%) of the borderline/intermediate group. This discovery was virtually identical to the findings of Dhiraj B et al. [9].

Benign tumors exceeded all other lesions in our analysis, with fibroadenoma being the most prevalent. Sulhyan K.R. et al. [10], Siddique et al. [11] research Mudholkar et al. [12] discovered that Fibroadenomas are the most common benign breast tumors. The second most prevalent benign lesion (48 instances), accounting for 18.9% of all benign lesions, was fibrocystic breast disease. According to Arunima Mukhopadhyay et al. [6], fibrocystic disease is the second most frequent benign breast lesion, accounting for 30% of all benign lesions.

Other benign lesions observed in our investigation included fibroadenosis, intraductal papilloma, gynaecomastia, and benign phyllodes. We also found 5 breast specimens with granulomatous inflammatory lesions. One of the granulomatous lesions was associated with infiltrating duct cell carcinoma of unknown kind. This finding is also highlighted in Sulhyan K.R. et al.'s [10] research.

According to surgical textbooks, the most prevalent histological form of breast cancer is invasive ductal carcinoma (not otherwise described). In our analysis, the most prevalent malignant lesion was invasive ductal carcinoma (not otherwise defined). 84 of the 92 malignant lesions were invasive ductal carcinoma NOS type, accounting for 91.3% of the malignant lesions and 24.12% of the total lesions

investigated. This finding is consistent with the findings of Letha Padmom et al. [13].

Aside from the conventional invasive ductal cell carcinoma, we discovered a few unusual histological forms of breast malignant tumors. There are three instances of medullary carcinoma (0.86%), one case of Paget disease of the nipple (0.3%), one case of mucinous carcinoma (0.3%), one case of clear cell carcinoma (0.3%), and one case of metaplastic carcinoma (0.3%). We identified two instances of borderline phyllodes tumor in the Borderline group, accounting for 0.57% of total breast lesions.

In the current research, we detailed these unusual situations and compared their occurrences to other original publications. (Table. 2)

Table 1: Spectrum of histopathological lesions of breast

	Lesions	Number of cases	Percentage in each category (%)	Percentage in total number of cases (%)
Non-malignant (non-neoplastic & benign lesions (N-254) 72.99%	Granulomatous	05	1.98	1.45
	Fibroadenoma	174	68.50	50.0
	Fibrocystic disease	48	18.90	13.80
	Fibroadenosis	12	4.72	3.44
	Intraductal papilloma	08	3.15	2.29
	Gynaecomastia	02	0.78	0.57
	Benign phyllodes	05	1.97	1.43
Borderline Lesions (N-2) 0.57%	Borderline phyllodes	02	100	0.57
Malignant lesions. (N-92) 26.44%	Invasive ductal carcinoma NOS	85	92.38	24.42
	Medullary carcinoma	3	3.26	0.86
	Metaplastic carcinoma	1	1.09	0.30
	Mucinous carcinoma	1	1.09	0.30
	Clear cell carcinoma	1	1.09	0.30
	Paget's disease of nipple	1	1.09	0.30

Table 2: Comparison of Unusual breast lesions with other original articles

Unusual lesions %	Dhiraj B. Nikumbh [9]	Desai M [1]	Malik R & Bharadwaj VK [14]	Present study
Benign	1.12	1.17	--	--
Borderline	0.2	--	--	0.57
Malignant	5.48	--	13.0	2.33

Medullary Breast cancer

Medullary carcinoma is a unique subtype of breast carcinoma that accounts for fewer than 5% of all invasive breast malignancies [14]. This distinct histologic subtype has very strict diagnostic criteria, including complete circumscription, syncytial growth of at least 75% of the tumor, intermediate to high nuclear grade, an associated increased number of activated cytotoxic lymphocytes, and the majority of the lymphoid infiltrate consists of T cells, indicating an active host response to the tumor and may account for its favourable prognosis. Our investigation comprised three instances of medullary cancer found in

mastectomy biopsies from women aged 50 to 55. The three lesions were all unicentric and well confined, measuring 3x2cm, 3x3cm, and 4x3cm in size, respectively. The skin on the sliced areas was meaty and grey-tan. There were foci of hemorrhage, necrosis, and cystic degeneration.

Because of the syncytial growth pattern, absence of glandular/tubular organization of tumor cells, and abundant lymphocytic infiltration, the tumor was identified as medullary carcinoma. In one instance, just one of the 12 axillary lymph nodes removed showed evidence of metastases. The other two individuals lacked lymph node metastases. All of

the lesions had tumor-free resection margins, including the tumor bed.

Paget disease of Nipple (Mammary Paget disease)

Paget's disease of the breast, a nipple-areola complex condition initially identified by Sir James Paget in 1874, [15] is a rare disease that accounts for 1-4.3% of all breast carcinomas. It is often related with in situ ductal carcinoma and/or invasive ductal carcinoma [16]. The current investigation comprised one instance of Paget disease of the nipple. A full thickness skin biopsy was obtained from the margin of an eczematous lesion in the nipple areola complex of the right breast of a 45-year-old woman suspected of having Paget disease. Clinical evaluation revealed no major breast masses. In the epidermal layer, the biopsy revealed characteristic big clear cells (Paget's cells) with pale and abundant cytoplasm and hyperchromatic nuclei with conspicuous nucleoli. A simple mastectomy was done, and a biopsy indicated that the patient had in situ duct cell carcinoma.

Clear cell carcinoma

Glycogen rich clear cell carcinoma (GRCC) is an uncommon form of breast cancer in which more than 90% of the neoplastic cells have extensive glycogen-containing clear cytoplasm [17]. Hull et al. [18] reported the first case of GRCC in 1981. Clear cell carcinoma of the breast is uncommon, accounting for 1.4-3% of all breast cancers and most usually afflicting women in their fifties. We discovered a case of clear cell cancer in a 42-year-old woman's left radical mastectomy material. The tumor measured 3x3cm in the upper inner quadrant of the left breast. A microscopic examination revealed a weakly differentiated breast cancer consisted of malignant cells with abundant transparent cytoplasm. There were necrotic regions. There was no evidence of lymphovascular infiltration. All of the resected margins were tumor-free. Tumor deposits were not seen in any of the six removed lymph nodes.

Metaplastic cancer

Metaplastic breast carcinoma is an uncommon but diverse kind of breast tumor that accounts for around 1% of all breast carcinomas [19]. This cancer is distinguished by the presence of at least two cellular types, often epithelial and mesenchymal components. MpBC is a triple-negative breast cancer (TNBC), which means that the tumor lacks expression of the estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor 2 receptor (HER2). MpBC is classified as mixed metaplastic carcinoma, low-grade adenosquamous carcinoma, fibromatosis-like, squamous cell carcinoma, spindle cell

carcinoma, and metaplastic carcinoma with mesenchymal differentiation by the WHO Classification of Breast Tumors [20]. Except for fibromatosis-like carcinoma and low-grade adenosquamous carcinoma, all of these metaplastic forms are aggressive and chemoresistant, with a high potential to metastasis [21]. We described a case of metaplastic cancer in a 55-year-old woman's right-sided radical mastectomy material. A gross inspection of the material revealed an irregular grey white growth measuring 3x3 cm in the top inner quadrant. Microscopic examination indicated a malignant glandular epithelial component with enhanced mitotic activity, as well as a localized poorly differentiated tumor component made up of disorganized sarcomatoid spindle cells and osteoclastic tumor giant cells. There are also zones of tumor necrosis. Three of the eight removed lymph nodes had epithelial tumor deposits.

Mucinous Breast cancer

Mucinous breast carcinoma (MBC) is a rare kind of breast cancer with a better prognosis than invasive ductal carcinoma. It is also known as breast colloid cancer. According to the WHO classification of breast tumors (2019) [22]. MBC is a form of breast cancer that may be separated into two categories depending on its cellularity:

- 1) The pure form (PMBC), which is more common and is made completely of tumor cells with extracellular and intracellular mucin in over 90% of the tumor mass.
- 2) The mixed type (MMBC), which contains less than 90% mucin and includes invading components such as ductal or lobular breast cancer-like components [23].

Our research includes a case of mucinous carcinoma in a 60-year-old woman's left radical mastectomy material. An irregular mass measuring 6x4 cm in the upper outer quadrant was discovered on gross inspection, with a gelatinous, mucoid cut surface. Clusters and nests of cells with low to intermediate grade nuclei floating in a mucin pool, separated by fibrous septa, were observed by microscopy. There was no lympho-vascular tumor invasion or tumor deposits in the 5 lymph nodes that were removed.

Conclusion

Along with mammography, MRI, and FNAC results, histopathology plays a significant role in the diagnosis, prediction, and treatment of breast disorders. More emphasis should be placed on routine clinical, radiographic, cytological, and histological approaches for assessing and diagnosing breast cancer so that suitable treatment modalities may be commenced. The most prevalent

benign lesion in the current research is fibroadenoma, which has a 68.50% incidence rate.

Infiltrating ductal carcinoma is the most frequent malignant lesion, accounting for 92.38% of all cases. We have described the odd lesions that we met throughout a three-year period. These characteristics will be important in patient treatment and have prognostic significance. Understanding these uncommon and underappreciated lesions is critical in today's age with variable differentials and varying prognosis of the lesion. The necessity of the hour is to undertake breast cancer screening programs as well as basic instruction and incentive for women to report to the doctor at an early stage if any breast lump is palpated, which may minimize the morbidity and mortality associated with breast tumors.

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