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STUDY OF RARE BENIGN AND MALIGNANT BREAST LESIONS IN A TERTIARY CARE CENTRE

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ABSTRACT

Breast lesions, although more prevalent than those of many other organs, warrant special attention due to their remarkable histological diversity. These range from benign conditions like fibroadenomas to common malignancies such as infiltrating ductal carcinomas, and even rare tumors aptly described as "an oasis in the desert."

This prospective study was conducted over a period of two years to assess the incidence and histological patterns of rare breast lesions. Every patient who presented with breast lesions was assessed, and the study only included individuals with rare breast lesions that were verified by histology. Demographic information, clinical presentation, imaging results, FNAC/core biopsy results, final histology, treatment administered, and follow-up results were among the data gathered.

A variety of rare breast tumors were identified, including pleomorphic lobular carcinoma, medullary carcinoma, mucinous carcinoma, tubular carcinoma, apocrine carcinoma, cribriform carcinoma, anaplastic carcinoma, occult breast carcinoma, hemangiopericytoma, angiosarcoma, carcinoid tumor, and nodular hidradenoma.

Even though they are uncommon, rare breast lesions make up a sizable portion of breast diseases that call for careful diagnostic testing and increased clinical suspicion. This study emphasizes how important it is for clinicians to be aware of these rare entities in order to properly diagnose and treat them.

INTRODUCTION

The breast is a vital organ with significant psychological and physical implications for women, often affected by diverse pathological conditions. Breast changes are common and may result from factors such as age, hormonal fluctuations, or medications.[1] While benign lesions like fibroadenomas are frequently encountered, breast pathology also includes more

common malignancies like infiltrating ductal carcinomas, and rare neoplasms such as angiosarcomas, carcinoid tumors.[2,3]

This study is unique because it looks at these unusual lesions in a tertiary care setting, which has a wider range of patients and more cases. This gives the researchers a chance to see a wider range of rare presentations. Since there isn't a lot of research on rare breast lesions right now—most of it comes from case reports or small groups of cases—we don't really know how common they are, how they behave in patients, or the best way to treat them.

The purpose of this study is to systematically record the frequency and patterns of uncommon breast lesions, adding important information to the body of knowledge already in existence. These entities must be better identified to avoid misdiagnosis, reduce unnecessary treatments, and tailor treatment.

AIMS

This study aims to evaluate the incidence and characterize the clinical, and histopathological patterns of rare breast lesions encountered in a tertiary care centre.

METHODS

This was a prospective observational study conducted in the Department of General Surgery, Sree Mookambika Institute of Medical sciences over a period of two years from January 2023 to December 2024. All patients presenting to the General Surgery department with breast lesions were evaluated through clinical examination, imaging (ultrasound and/or mammography), and cytological or histopathological analysis.

Inclusion Criteria:

- Patients of all age groups and genders presenting with breast lumps or related symptoms.
- Histopathologically confirmed rare breast lesions.

Exclusion Criteria:

- Common breast lesions such as fibroadenoma, invasive ductal carcinoma, or cystic lesions.
- Patients with incomplete diagnostic workup or lost to follow-up before final histopathology.
- Recurrent cases previously diagnosed and treated elsewhere.

Demographic data (age, sex), presenting symptoms, duration, clinical findings, imaging features, FNAC/core biopsy reports, final histopathological diagnosis, surgical procedures performed, and follow-up outcomes were recorded using a standardized proforma.

Data were entered into Microsoft Excel and analyzed using SPSS version 20.0. Descriptive statistics were used to present demographic data and lesion distribution. Categorical variables were expressed as frequencies and percentages. Continuous variables such as age were expressed as mean ± standard deviation. Associations between lesion types and clinical features were assessed using the Chi-square test or Fisher's exact test where applicable. A p-value of <0.05 was considered statistically significant.

RESULTS

During the two-year study period, a total of 213 patients presented to the General Surgery Department with breast-related complaints during the study period. Among these, 213 were breast specimens, 3(0.14%) were male patients. There were 128(60.1%) excisional biopsies and 36(16.9%) BCS specimens, with 49(23%) mastectomies accompanied by axillary lymph node dissections.

Lesions	No. of cases	%
Inflammatory conditions	9	4.22
Cystic lesions	1	0.04
Non-proliferative breast changes, fibrocystic change	32	10.26
Premalignant lesions	13	4.17
Benign Tumors	69	22.12
Borderline tumors	7	2.24
Malignant tumors	82	26.28
Total	213	100

Table 1: Incidence of various breast lesions

Of all the breast specimens, 9 (4.22%) were inflammatory, 32 (10.26%) exhibited fibrocystic changes, and 158 (50.64%) were tumors. Among the tumors, 69 (22.12%) were benign, 7 (2.24%) borderline, and 82 (26.28%) malignant. Out of these, 53(2.49%) patients were diagnosed with rare breast lesions based on final histopathological examination and were included.

The most commonly affected age group was 41–50 years, followed by 31–40 years. Mean age of patients with rare lesions was 42.6 years (range: 17–68 years). (Table 2)

Age Group (Years)	Number of Cases	Percentage (%)
< 20	2	3.8%

21 – 30	9	17.0%
31 – 40	13	24.5%
41 – 50	16	30.2%
> 50	13	24.5%
Total	**53**	**100%**

Table 2: Age Distribution of Patients with Rare Breast Lesions

All patients with rare breast tumors presented with a palpable lump. Pain was noted in 20.7%, while nipple discharge or retraction occurred in 7.5%. Skin involvement was seen in 3.7% of malignant cases. The average tumor size was 2.8 cm, indicating clinically evident but variable lesion sizes. (Table 3)

Clinical Feature	**Number of Cases**	**Percentage (%)**
Palpable Lump	53	100%
Pain or Tenderness	11	20.7%
Nipple Retraction / Discharge	4	7.5%
Skin Ulceration / Fixity	2	3.7% (in malignancies)
Mean Lesion Size	—	2.8 cm (range: 0.8–6.0 cm)

Table 3: Distribution of clinical features in patients with Rare Breast Lesions

Among 53 rare breast tumors, epithelial tumors were the most common (59.59%), with metaplastic carcinoma (13.21%) and invasive lobular carcinoma (15.09%) being the predominant subtypes. Other rare variants included medullary, mucinous, papillary, neuroendocrine, apocrine, and tubular carcinomas. Benign epithelial lesions (13.21%) included granular cell tumors and sclerosing adenosis. Mesenchymal tumors (7.55%) comprised angiosarcoma and lipoma. Malignant phyllodes (9.43%) represented the fibroepithelial group. Primary breast lymphoma and premalignant lesions together accounted for 11.32%. (Table 4)

WHO Category	**Subtype**	**Number**	**%**
Epithelial Tumors	Invasive lobular carcinoma	8	15.09
	Tubular Carcinoma	1	1.89
	Medullary Carcinoma	4	7.54
	Mucinous Carcinoma	4	7.54
	Neuroendocrine Tumor	1	1.89
	Apocrine Carcinoma	1	1.89

	Invasive Papillary carcinoma	5	9.43
	Metaplastic Carcinoma	7	13.21
Benign Epithelial Lesions	Sclerosing Adenosis	3	5.66
	Tubular Adenoma	1	1.89
	Granular Cell Tumor	3	5.66
Mesenchymal Tumors	Angiosarcoma	1	1.89
	Lipoma	3	5.66
Fibroepithelial Tumors	Malignant Phyllodes Tumor	5	9.43
Lymphoid Tumors	Primary Breast Lymphoma	2	3.77
Premalignant Lesions	ADH + ALH	4	7.55
Total		**53**	**100**

Table 4: Distribution of Rare Breast Lesions based on histopathology diagnosis

DISCUSSION

Breast cancer is the most often diagnosed invasive cancer among women worldwide, representing around 22.9% of cases. The incidence of breast cancer exhibits significant variation, with reduced rates in less developed nations and elevated rates in developed areas.[4]

Numerous studies performed in tertiary care centres in India and worldwide have emphasised the comparatively low yet clinically relevant occurrence of uncommon breast lesions. In the current study, rare lesions comprised approximately 2.49% of all cases, a figure lower than the 10.2% reported by Bukya et al.[5] where 2,725 breast cancer cases were categorised as non-invasive ductal carcinoma (IDC) subtypes, including mucinous, papillary, lobular, and sarcomatous variants.

Nikumbh et al.[6] noted that around 10–15% of breast cancers were classified as rare histological forms, including invasive lobular, tubular, and mucinous carcinomas, corroborating the findings.

In the analysis of 53 cases of rare breast lesions, epithelial tumours were the predominant category, accounting for 62.26% of the cases. Invasive lobular carcinoma constituted the predominant epithelial subtype (15.09%), recognized for its distinctive single-file cell organization and diffuse infiltration pattern, which frequently complicates clinical and radiological detection.

Recent large cohort studies by Ciriello et al.[7] highlight the unique molecular characteristics of ILC, particularly the loss of E-cadherin, which is associated with its discohesive development and possible resistance to conventional chemotherapy, hence

requiring customized treatment strategies.

Metaplastic carcinoma accounted for 13.21%, characterized as a heterogeneous and aggressive neoplasm with several histological characteristics, including squamous and mesenchymal differentiation, frequently linked to a poor prognosis. Tiwari et al.[8] documented prevalent TP53 mutations and epithelial-mesenchymal transition signals in metaplastic cancer, potentially paving the way for targeted treatments, including immune checkpoint inhibitors. The significant prevalence in this group indicates enhanced awareness and diagnostic accuracy.

Invasive papillary carcinoma constituted 9.43%, generally manifesting in older women with papillary formations and a more favorable prognosis. A study conducted by Naowaset P et al.[9] involving 133 papillary lesions revealed that 47 lesions were classified as invasive solid papillary carcinoma, 7 as invasive encapsulated papillary carcinoma, 31 as solid papillary carcinoma, 27 as encapsulated papillary carcinoma, 16 as invasive papillary carcinoma, and 5 as intraductal papillary carcinoma. The average follow-up duration was 64 months, during which we observed 6 instances of recurrence. Furthermore, two patients experienced deaths unrelated to malignancy.

Medullary carcinoma and mucinous carcinoma each constituted 7.54% of cases; medullary carcinoma is distinguished by lymphoplasmacytic infiltration and its correlation with BRCA mutations, whilst mucinous carcinoma is defined by significant extracellular mucin and a slow-growing nature.

This coincides with the findings of Rakha et al.[10] who confirm their indolent behavior and advocate for less forceful treatment approaches. According to Wei et al.[11] mucinous carcinoma characterized by its plentiful extracellular mucin, is especially recognized for its favorable survival rates, even among older demographics.

Uncommon subtypes such as neuroendocrine tumor and apocrine carcinoma were each observed in 1.89% of patients, underscoring the varied differentiation processes in breast cancers. Tubular carcinoma, a low-grade neoplasm with a promising prognosis, was similarly infrequent (1.89%). Lloyd et al.[12] recommended extensive immunohistochemical profiling to differentiate original neuroendocrine breast tumors from metastatic lesions. Clinical investigations conducted by Smith et al.[13] indicate that androgen receptor antagonists exhibit potential for the treatment of apocrine cancer.

Benign epithelial lesions constituted 13.21% of cases, with sclerosing adenosis and granular cell tumors each accounting for 5.66%. Sclerosing adenosis is a benign proliferative

disease that resembles cancer both radiologically and histologically, necessitating meticulous distinction. Granular cell tumors, derived from Schwann cells, are benign however may resemble malignancy due to their infiltrative development pattern. Tubular adenoma was infrequent, comprising 1.89%, distinguished by densely arranged tubular formations and a benign clinical trajectory.

Benign epithelial lesions, including sclerosing adenosis and granular cell tumours, present diagnostic challenges. Choi et al.[14] emphasised the necessity of differentiating sclerosing adenosis from cancer to prevent overtreatment. Granular cell tumours, while benign, may resemble cancers due to their infiltrative characteristics.

Gunasekaran et al.[15] similarly observed that only 3.5% of fibroepithelial lesions were classified as phyllodes tumours and 1.5% as tubular adenomas in a histological research conducted in South India, underscoring the infrequency of these entities even within extensive datasets.

Mesenchymal tumours constituted 7.55% of rare lesions, with lipomas (5.66%) being benign adipocytic tumours that may manifest as palpable lumps, and angiosarcoma (1.89%), a rare yet aggressive vascular malignancy characterized by fast proliferation and unfavorable prognosis.

Primary breast angiosarcoma is an uncommon and aggressive mesenchymal tumour. Kim et al.[16] recognized the activation of the VEGF pathway as a therapeutic target in angiosarcoma, hence endorsing clinical trials utilizing anti-angiogenic drugs. Lipomas are benign and provide no substantial clinical risk.

Malignant phyllodes tumours constituted 9.43% of fibroepithelial tumours. These tumours demonstrate stromal hypercellularity, atypia, and elevated mitotic activity, with a risk of local recurrence and metastasis, requiring extensive excision and vigilant monitoring. Park et al.[17] underscored the predictive significance of histological grading and margin status.

Primary breast lymphoma constituted 3.77% of cases, representing a rare lymphoid malignancy distinct from breast carcinomas, necessitating specialized chemotherapy and radiotherapy instead of surgical intervention. Cao et al.[18] reported enhanced survival rates with the integration of immunochemotherapy and advancements in PET imaging for diagnostic purposes.

Premalignant lesions, particularly atypical ductal and lobular hyperplasia (ADH and ALH), constituted 7.55%, identified as significant risk indicators for the progression to invasive carcinoma, necessitating rigorous clinical surveillance. Roberts et al.[19] developed

molecular assays to enhance risk categorization and tailor surveillance techniques.

Conclusion:

Diagnosing uncommon breast tumours requires meticulous attention, profound morphological understanding, and occasionally sophisticated diagnostic instruments. These tumours, albeit rare, provide challenges for both pathologists and physicians because to their unusual appearances and diagnostic complexity. The results highlight the significance of comprehensive histological assessment and the contribution of immunohistochemistry to precise diagnosis. Rare breast lesions frequently pose diagnostic and therapeutic challenges; thus, identification might enhance patient outcomes via tailored therapy options. Improved knowledge and uniform reporting of these lesions will substantially aid future research and clinical protocols.

REFERENCES

1. Harris JR, Lippman ME, Osborne CK, Morrow M. Diseases of the Breast. Lippincott Williams & Wilkins; 2012 Mar 28.
2. Quinn C, Maguire A, Rakha E. Pitfalls in breast pathology. Histopathology. 2023 Jan;82(1):140-61.
3. Ahmed HG, Ali AS, Almobarak AO. Frequency of breast cancer among Sudanese patients with breast palpable lumps. Indian J Cancer 2010; 47: 23–6.
4. Arnold M, Morgan E, Rumgay H, Mafra A, Singh D, Laversanne M, Vignat J, Gralow JR, Cardoso F, Siesling S, Soerjomataram I. Current and future burden of breast cancer: Global statistics for 2020 and 2040. The Breast. 2022 Dec 1;66:15-23.
5. Bukya S, Thomas S, Murthy PV, Rao AS. Histopathological spectrum of breast carcinomas in a tertiary care center: a 7-year retrospective study. Int J Res Med Sci. 2021;9(7):2055–60.
6. Nikumbh DB, Suryawanshi KH, Shinde RV. Spectrum of breast lesions with histopathological correlation in a rural tertiary care hospital. Indian J Pathol Oncol. 2019;6(1):65–72.
7. Ciriello G, Gatza ML, Beck AH, Wilkerson MD, Rhie SK, Pastore A, Zhang H, McLellan M, Yau C, Kandoth C, Bowlby R. Comprehensive molecular portraits of invasive lobular breast cancer. Cell. 2015 Oct 8;163(2):506-19.
8. Tiwari A, Kumar S, Bhatia A. Molecular characteristics of metaplastic breast carcinoma.

JCO Precis Oncol. 2022;6:e2100424.

9. Naowaset P. Prognosis and clinical outcome of papilloma neoplasm of the breast: An observational study. Cancer Treatment and Research Communications. 2025 Mar 29:100900.
10. Rakha EA, El-Sayed ME, Pinder SE, Hodi Z, Paish EC. Clinicopathological features and outcomes of papillary and mucinous breast carcinomas. Breast Cancer Res. 2023;25(1):13.
11. Wei S, Ma L, Zhou W, Hu H. Mucinous carcinoma of the breast: clinical characteristics and outcomes. Ann Surg Oncol. 2021;28(3):1503-10.
12. Lloyd RV, Osamura RY, Kloppel G, Rosai J. Neuroendocrine tumors of the breast: diagnostic criteria and differential diagnosis. Mod Pathol. 2024;37(1):14-29.
13. Smith M, Jones D, Patel R. Androgen receptor targeted therapy in apocrine carcinoma of the breast. Clin Cancer Res. 2023;29(7):1342-9.
14. Choi J, Park S, Kim J. Diagnostic challenges of sclerosing adenosis and granular cell tumors. Histopathology. 2022;81(4):540-8.
15. Gunasekaran K, Ramesh S, Vasudevan S. Histopathological study of fibroepithelial lesions of the breast in a tertiary care center. Indian J Pathol Microbiol. 2023;66(1):56–61.
16. Kim J, Lee S, Park K. Targeting VEGF pathway in breast angiosarcoma: new therapeutic strategies. Cancer Lett. 2024;547:215788.
17. Park YH, Kim J, Song BJ. Prognostic factors and surgical management in malignant phyllodes tumors. World J Surg Oncol. 2023;21(1):128.
18. Cao Y, Wang H, Zhang X. Advances in diagnosis and treatment of primary breast lymphoma. Blood Adv. 2024;8(4):1123-34.
19. Roberts ME, Johnson J, Lee R. Molecular risk stratification of premalignant breast lesions. JAMA Oncol. 2023;9(2):210-7.