

Original Research Article

Analysis of histopathological findings of breast biopsies at a tertiary care centre

Bimal Shah¹, Mita Shah^{2*}, Sarang Degloorkar¹, Sanjay Parab¹, Ria Vijay³

¹Department of General Surgery, Bhaktivedanta Hospital and Research Institute, Mira Road (East), Thane, Maharashtra, India

²Department of Histopathology, Apoorva Diagnostic and Healthcare, Bhaktivedanta Hospital and Research Institute, Mira Road (East), Thane, Maharashtra, India

³Clinical Research Associate and Writer, Bhaktivedanta Hospital and Research Institute, Mira Road (East), Thane, Maharashtra, India

Received: 28 March 2023

Revised: 02 May 2023

Accepted: 04 May 2023

***Correspondence:**

Dr. Mita Shah,

E-mail: mitayshah@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: In India, breast cancer has become a leading cause of cancer death. The indication of a breast lump can be cause of great concern in most patients. While most of the lumps are benign in nature, there is a possibility of an increased risk of developing premalignant lesions. Any breast mass/lump requires histological diagnosis to get a clear picture of the lump associated problems.

Methods: This is a retrospective, descriptive and a cross-sectional study of all the patients with breast lumps seen in Bhaktivedanta Hospital and Research Institute from January 2018 till March 2022. Histopathology reports of breast biopsies of patients required at Bhaktivedanta Hospital and Research Institute were included in the study.

Results: The total number of cases of breast biopsies available were 449. These cases are grouped into benign and malignant cases which comprise of 276 (61.47%) and 173 (38.53%) cases respectively. The most common benign diagnosis observed was fibroadenoma which accounted for 184 (66.67%) cases. Based on age grouping, the 21-40 age group contained the maximum number of benign cases. The most common malignancy observed was of ductal carcinoma with 163 (94.21%) cases. Based on age grouping, the age group of 41-60 contained the maximum number of malignant cases.

Conclusions: It is imperative that all breast lesions should undergo biopsies irrespective of clinical findings for the following reasons: rising incidence of breast cancer, to rule out/confirm malignancy and to complete the diagnostic triad of clinical diagnosis, radiology and pathology.

Keywords: Breast biopsy, Histopathology, Diagnosis, Benign, Malignant

INTRODUCTION

Globally, cancer has emerged to be the second leading cause of death. Breast cancer cases comprise a total of 18% cancers in women. In India breast cancer has become a leading cause of cancer death and about 50,000 women per year die of breast cancer.¹ It is observed that women of the age group of 18-40 have lower breast cancer disease

burden. The disease burden is moderate in the age group of 40-50 years and is very high in women above 50 years of age.²

Breast cancer is diverse in ways that it can be distinguished based on clinical, biological and morphological characteristics. Death by breast cancer is mainly associated with the extent of tumour aggression which in turn depends

on different histopathological stages.³ It is seen that most tumours arrive from the mammary ductal epithelium and approximately 75% of these malignant tumours are diagnosed as infiltrating duct carcinoma. The other common type is invasive lobular carcinoma which encompasses approximately 15% of the lumps.⁴

The indication of a breast lump can be cause of great concern in most patients. While most of the lumps are benign in nature, there is a possibility of an increased risk of developing premalignant lesions.⁵ Any breast mass/lump requires histological diagnosis to get a clear picture of the lump associated problems.⁶

According to a systematic review and meta-analysis paper, it is divulged that the chances of breast cancer rise by up to two folds in people suffering from breast benign diseases without a structural abnormality in cells (atypia) and those people having breast benign disease along with atypia show a fivefold increase in development of breast cancer.⁷ This indicates rising risk of getting breast cancer from premalignant lesions like atypical ductal hyperplasia and atypical lobular hyperplasia. This can give rise to in situ ductal and lobular carcinoma, respectively.⁸ Hence, it is imperative for surgeons to distinguish premalignant lesions from benign through biopsy and conduct histopathological analysis to understand the findings in a detailed manner.⁹

Among the breast benign lesions, fibroadenomas are the most common lesions seen in women as a single breast mass. They encompass almost 50% of all cases of breast biopsies and in younger women, it has been observed that 75% of cases are of fibroadenomas.¹⁰

The look of the benign lesions histologically is associated very strongly with the risk of developing breast cancer.¹¹ Histopathological diagnoses is an important feature to consider for managing breast lump diseases. It helps in establishing the type of disease, various treatment modalities and results of the treatment and management.¹²

The objective of the study was to analyse and characterize the histopathological pattern of breast biopsies at a tertiary care centre.

METHODS

This is a retrospective, descriptive and a cross-sectional study of all the patients with breast lumps seen in Bhaktivedanta Hospital and Research Institute from January 2018 till March 2022. Ethical approval from the Institutional Ethics Committee was obtained for this study. Histopathology reports of breast biopsies of patients required at Bhaktivedanta Hospital and Research Institute were included in the study. The eligibility criteria of the patients were as follow: patients who have undergone breast biopsy, patients whose data and reports (as per the requirements of the protocol) are available at the site, gender- both females and males, and patients of any age.

The specimen when taken from the patient's body is stored in a container with 10% Neutral Buffered Formalin (NBF). The specimen collected is sent to the pathology lab for histopathological analysis and diagnosis. The container containing the specimen is labelled and sent to the lab. The sample is processed in multiple steps. Firstly, sample acceptance and numbering are done in the lab after which grossing of the sample is done. Tissue processing and embedding is then carried out after which block cutting of the samples is done. The samples then undergo hematoxylin and eosin staining. The sample will then be mounted, labelled and arranged in trays. The final report is submitted to the pathologist for analysing the samples. The histopathological data will be obtained from the histopathology registers containing the reports from the pathology lab of Bhaktivedanta Hospital and Research Institute. Demography (age, gender), year of biopsy, diagnosis of benign and malignant cases is reported and analysed. Statistical tests will be applied to analyse the histopathological data.

Statistical tool

The numeric data will be summarized by descriptive statistics like; n, mean $\pm$ SD, median, minimum, maximum. Before applying any statistical test, normality test will be performed. The categorical data will be summarized by frequency count and percentage and significance will be analysed using Chi-square/Fisher exact test. Descriptive statistics will be applied to analyse the parameters based on histopathological findings of breast biopsies. All statistical data will be analysed by IBM statistical package for the social sciences (SPSS) software v.16.0 and would be expressed as means $\pm$ SD. As this was a retrospective study the sample size was not calculated.

RESULTS

The total number of cases of breast biopsies available over the period of four years from January 2018 to May 2022 were 449. These cases are grouped into benign and malignant cases which comprise of 276 (61.47%) and 173 (38.53%) cases respectively (Table 1).

Table 1: Total cases of breast biopsies.

Breast biopsies	Count	%
Benign	276	61.47
Malignant	173	38.53
Total	449	

Classification of benign cases based on diagnosis are grouped into 12 categories. The most common diagnosis observed was fibroadenoma which accounted for 184 (66.67%) of the total cases of benign. All 184 cases were reported in females. This was followed by fibrocystic disease which occurred in 33 (11.96%) cases of benign. All cases of fibrocystic disease were reported in females only. Only 3 cases of males were seen in benign diagnosis under the following categories: bacterial infection,

gynaecomastia and duct papilloma as mentioned in Table 2. Based on age grouping, the 21-40 age group contained the maximum number of benign cases, that is, 136 (49.27%) (Table 3).

This was followed by the age group 41-60 containing 86 (31.16%) cases. Classification of malignant cases based on diagnosis were grouped into six categories. The most common diagnosis observed was of ductal carcinoma with 163 (94.21%) cases. Out of this, 162 cases of ductal carcinoma were of females and 1 case of ductal carcinoma was of a male. The female to male ratio is 1:0.005 as seen in Table 4.

Based on age grouping, the age group of 41-60 contained the maximum number of malignant cases, that is, 92 (53.18%) (Table 5). This was followed by the age group 61-80 containing 53 (30.64%) cases as seen in Table 5.

Table 2: Classification of benign based on diagnosis.

Diagnosis	Total (%)	Female	Male	F:M ratio
Fibroadenoma	184 (66.67)	184	0	1:0
Fibrocystic disease	33 (11.96)	33	0	1:0
Bacterial infection	22 (7.9)	21	1	1:0.05
Granulomatous mastitis	10 (3.62)	10	0	1:0
Phyllodes tumour	7 (2.53)	7	0	1:0
Sebaceous cyst	5 (1.81)	5	0	1:0
Duct ectasia	5 (1.81)	5	0	1:0
Gynaecomastia	4 (1.44)	3	1	3:1
Intraductal papilloma	2 (0.72)	2	0	1:0
Chronic mastitis	2 (0.72)	2	0	1:0
Duct papilloma	1 (0.36)	0	1	0:1
Galactocele	1 (0.36)	1	0	1:0
Total	276 (98.91)	273 (98.91)	3 (1.09)	1:0.01

Table 3: Age grouping of benign cases.

Age groups (in years)	Count (%)
≤20	31 (11.23)
21-40	136 (49.27)
41-60	86 (31.16)
61-80	23 (8.3)
≥81	0 (0.00)

Table 4: Classification of malignancy based on diagnosis.

Diagnosis	Total (%)	Female	Male	F:M ratio
Ductal carcinoma	163 (94.21)	162	1	1:0.006
Phyllodes tumour	4 (2.31)	4	0	1:0
Papillary	3 (1.73)	3	0	1:0
Mucinous carcinoma	1 (0.58)	1	0	1:0
Tubular	1 (0.58)	1	0	1:0
Spindle cell	1 (0.58)	1	0	1:0
Total	173 (99.42)	172 (99.42)	1 (0.58)	1:0.005

Table 5: Age grouping of malignant cases.

Age groups (in years)	Count (%)
≤20	0 (0.00)
21-40	22 (12.71)
41-60	92 (53.18)
61-80	53 (30.64)
≥81	6 (3.47)

DISCUSSION

There is a lot of apprehension when it comes to identifying the symptoms of breast diseases as they may be related to pre-malignancies or could lead to development of breast cancer and therefore, it is imperative to get breast biopsies done in both females and males as required. Histopathological analysis of such breast biopsies will help in identifying the proper diagnosis and effective treatment options.¹³

This will help in understanding and targeting breast diseases at an early level especially in cases of malignancies and in early age groups that are prone to malignant conditions.¹⁴

The breast biopsies that were conducted at our site were received and analysed by Bhaktivedanta Hospital and Research Institute from the year 2017 to 2022.

The results of the breast biopsies conducted at our site showed that 61.47% cases were benign lesions and 38.53% of the total cases were malignant. This shows that the majority of the breast biopsy cases turned out to be benign breast diseases. In two Nigerian studies conducted by Ochicha et al and Aniykam et al similar results were obtained which showed that benign breast lesions accounted for 73% and 68.6% cases of the total breast biopsies conducted.^{15,16} In studies by Njeze, Amr et al, a higher figure of 83% and 85.1% of benign breast lesions

was reported.^{9,17} However, according to the findings of a study in Pakistan as reported by Sidiqqi et al, the most common finding was breast carcinoma.¹⁸

In keeping with the published data, the age group of 21-40 years observed the maximum number of benign cases.⁹ The most common finding among benign breast biopsies was fibroadenoma which accounted for about 66.67% cases. Similar findings were reported in two Nigerian studies where fibroadenoma was the most common benign breast disease observed.^{9,19} A study conducted by Amrr et al in Saudi Arabia showed over 30% cases of fibroadenoma at their site.¹⁷ It has been seen that cases of fibroadenomas are more commonly observed in dark-skinned people.^{20,21} A much lower rate of 11% of fibroadenoma cases were seen in a study by Ellis et al in England. It has been noted that environmental and not genetic factors are responsible for the risk of fibroadenoma.^{10,22,23}

Fibrocystic cases account for about 11.96% of the total benign cases at our site. This result was consistent with the findings of a past study.²⁴ In our study, the frequency of phyllodes tumours accounted for about 2.53% of the total benign breast lesions. Similar results were also obtained by two studies conducted in Karachi and Italy respectively.^{9,25} In our study, 38.54% of the total breast biopsy cases turned out to be malignant and majority of these malignant cases occurred in the age group of 41-60 years. These findings were similar to the results published by a study in Nigeria and Ghana.^{26,27} In keeping with the published data, the majority of the malignant cases at our site were of ductal carcinoma.^{9,26,28} There was only one case of male breast malignancy (0.58%) in a total of 173 cases of breast malignancies observed at our site. In a study conducted at a hospital in Nigeria by Kidmas et al, the cases of male malignancies accounted for about 8.6%.²⁹ However, in another study by Nzegwu et al, there were no cases of male breast malignancy found in a total of 1050 breast biopsies.³⁰

The limitation of the study is that, firstly, it is only conducted at one centre. Secondly, since the study is retrospective in nature, the analysis was based on existing patient data.

CONCLUSION

It is imperative that all breast lesions should undergo biopsies irrespective of clinical findings for the following reasons: Rising incidence of breast cancer, to rule out/confirm malignancy and to complete the diagnostic triad of clinical diagnosis, radiology and pathology.

ACKNOWLEDGEMENTS

Authors would like to thank Dr. Vijaykumar Gawali and Ms. Vrutti Mistry, Department of Medical Research for their constant support and efforts throughout the conduct of the study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Ferlay J, Héry C, Autier P, Sankaranarayanan R. Global Burden of Breast Cancer. *Breast Cancer Epidemiol.* 2009;1-19.
2. Malvia S, Bagadi SA, Dubey US, Saxena S. Epidemiology of breast cancer in Indian women. *Asia Pac J Clin Oncol.* 2017;13(4):289-95.
3. Nikumbh DDB, Kanthikar S, Suryawanshi K, Jagtap S, Dravid N, Gondane SR. Histopathological Spectrum of Unusual Breast Lesions: A Seven Year Retrospective Review. *Semantic Scholar.* 2016;53960783.
4. Yerushalmi R, Hayes MM, Gelmon KA. Breast carcinoma--rare types: review of the literature. *Ann Oncol.* 2009;20(11):1763-70.
5. Olu-Eddo AN, Ugiagbe EE. Benign breast lesions in an African population: A 25-year histopathological review of 1864 cases. *Niger Med J.* 2011;52(4):211-6.
6. Aslam HM, Saleem S, Shaikh HA, Shahid N, Mughal A, Umah R. Clinico- pathological profile of patients with breast diseases. *Diagn Pathol.* 2013;8:77.
7. Dyrstad SW, Yan Y, Fowler AM, Colditz GA. Breast cancer risk associated with benign breast disease: systematic review and meta-analysis. *Breast Cancer Res Treat.* 2015;149(3):569-75.
8. Sasaki J, Geletzke A, Kass RB, Klimberg VS, Copeland EM, Bland KI. Etiology and Management of Benign Breast Disease. *The Breast.* 2018;79-92.
9. Njeze GE. Breast lumps: a 21-year single-center clinical and histological analysis. *Niger J Surg.* 2014;20(1):38-41.
10. Greenberg R, Skornick Y, Kaplan O. Management of breast fibroadenomas. *J Gen Intern Med.* 1998;13(9):640-5.
11. Hartmann LC, Sellers TA, Frost MH, Lingle WL, Degnim AC, Ghosh K, et al. Benign Breast Disease and the Risk of Breast Cancer. *N Engl J Med.* 2005;353(3):229-37.
12. Titiloye NA, Bedu-Addo K, Manu EA, Ameh-Mensah C, Opoku F, Duduyemi BM. Breast lesions and cancer: histopathology and molecular classification in a referral hospital in Ghana. *Alexandria J Med.* 2021;57(1):130-6.
13. Torous VF, Schnitt SJ, Collins LC. Benign breast lesions that mimic malignancy. *Pathology.* 2017;49(2):181-96.
14. Brinton L, Figueroa J, Adjei E, Ansong D, Biritwum R, Edusei L, et al. Factors contributing to delays in diagnosis of breast cancers in Ghana, West Africa. *Breast Cancer Res Treat.* 2017;162(1):105-14.
15. Edino S, Ochicha O, Mohammed A, Amin S. Benign breast lesions in Kano. *Nig J Surg Res.* 2002;4(1).

16. Anyikam A, Nzegwu MA, Ozumba BC, Okoye I, Olusina DB. Benign breast lesions in Eastern Nigeria. *Saudi Med J.* 2008;29(2):241-4.
17. Amr SS, Sa'di AR, Ilahi F, Sheikh SS. The spectrum of breast diseases in Saudi Arab females: A 26 year pathological survey at Dhahran Health Center. *Ann Saudi Med.* 1995;15(2):125-32.
18. Siddiqui MS, Kayani N, Gill MS, Pervez S, Muzaffar S, Aziz SA, et al. Breast diseases: a histopathological analysis of 3279 cases at a tertiary care center in Pakistan. *J Pak Med Assoc.* 2003;53(3):94-7.
19. Oluwole SF, Freeman HP. Analysis of benign breast lesions in blacks. *Am J Surg.* 1979;137(6):786-9.
20. Funderburk WW, Rosero E, Leffall LD. Breast lesions in blacks. *Surg Gynecol Obstet.* 1972;135(1):58-60.
21. Fibroadenoma of the breast: MedlinePlus Medical Encyclopedia. Available at: <https://medlineplus.gov/ency/article/007216.htm#:~:text=Fibroadenoma%20is%20the%20most%20common>. Accessed on 16 November 2022.
22. Ellis H, Cox PJ. Breast problems in 1,000 consecutive referrals to surgical out-patients. *Postgrad Med J.* 1984;60(708):653-6.
23. Rohan TE, Cook MG, Potter JD, McMichael AJ. A case-control study of diet and benign proliferative epithelial disorders of the breast. *Cancer Res.* 1990;50(11):3176-81.
24. Nasir MMA, Huma I, Omer S, Sadia, Muhammad A, Ayesha S, et al. Breast diseases; spectrum in Wah Cantt; POF hospital experience. *Professional Med J.* 2010;17(3):366-72.
25. Masciadri M, Ferranti C. Benign breast lesions: Ultrasound. *J Ultrasound.* 2011;14(2):55-65.
26. Irabor DO, Okolo CA. Outcome of one hundred and forty-nine consecutive breast biopsies in Ibadan, Nigeria. *Breast Dis.* 2012;33(3):109-14.
27. Clegg-Lampsey JNA, Hodasi WM. A study of breast cancer in korle bu teaching hospital: assessing the impact of health education. *Ghana Med J.* 2010;41(2).
28. Makki J. Diversity of Breast Carcinoma: Histological Subtypes and Clinical Relevance. *Clinical Medicine Insights: Pathology.* 2015;8:23-31.
29. Kidmas AT, Ugwu BT, Manasseh AN, Iya D, Opaluwa AS. Male breast malignancy in Jos University Teaching Hospital. *West Afr J Med.* 2005;24(1):36-40.
30. Nzegwu MA, Anyikam A, Ozumba BC, Ugochukwu AI, Agu KA. Malignant breast lesions in Eastern Nigeria. *Saudi Med J.* 2008;29(5):778-80.

Cite this article as: Shah B, Shah M, Degloorkar S, Parab S, Vijay R. Analysis of histopathological findings of breast biopsies at a tertiary care centre. *Int Surg J* 2023;10:1009-13.