

Malignant Breast Lump: To Classify It Based on clinico-demographic Features and To Assess the Correlation Between Tumor Size and Axillary Lymph Node Positivity

Maryam Basharat*, Muhammad Imran Anwar

Department of General Surgery and Surgical Oncology, Shaikh Zayed Hospital Lahore, Pakistan

*Corresponding author's email address: maryambasharat93@gmail.com

(Received, 24th December 2024, Revised 9th January 2024, Published 31st January 2025)

Abstract: Breast cancer is a leading cause of mortality in females, accounting for approximately 25% of all breast cancers and contributing to 15% of cancer-related deaths in women. Infiltrating ductal carcinoma is the most common histological type, with axillary lymph node involvement being a critical prognostic factor, particularly in early breast cancer. **Objective:** To evaluate the relationship between tumor characteristics, size and consistency, and axillary lymph node involvement in breast cancer patients. **Methods:** This observational cross-sectional study was conducted in the General Surgery and Surgical Oncology Unit of Shaikh Zayed Hospital, Lahore. A total of 165 patients were included using a non-probability consecutive sampling technique. Demographic and clinical data were collected, including tumor size, laterality, site, and consistency, and their relationship with axillary lymph node positivity was analyzed. **Results:** The mean age of patients was 45.45 ± 6.31 years, and the mean size of malignant breast lumps was 3.57 ± 0.84 cm. Most tumors (88.48%) measured 2-5 cm, while tumors >5 cm and <2 cm accounted for 7.28% and 4.24%, respectively. Left-sided breast lumps were more common (55.15%) than right-sided lumps (44.85%). Tumor size and consistency were significantly associated with axillary lymph node positivity, with p -values <0.05 . **Conclusion:** Axillary lymph node involvement remains an independent risk factor for breast cancer prognosis. Tumor size and consistency are strongly associated with the number of positive lymph nodes, emphasizing their role in the clinical evaluation and management of breast cancer.

Keywords: Breast Neoplasms Axillary Lymph Nodes, Lymphatic Metastasis Carcinoma, Ductal, Breast Survival Rate

[How to Cite: Basharat M, Anwar MI. Malignant breast lump: to classify it based on clinico-demographic features and to assess the correlation between tumor size and axillary lymph node positivity. *Biol. Clin. Sci. Res. J.*, 2025; 6(1): 29-33. doi: <https://doi.org/10.54112/bcsrj.v6i1.1471>]

Introduction

One of the leading causes of mortality in females is breast cancer, which accounts for approximately 25% of all breast cancers. (1) There are many histological types of CA breast, but the most common is infiltrating ductal carcinoma. (2) Survival outcomes of breast carcinoma depend upon several factors. Still, the most important are the stage of the carcinoma, the patient's age, the involvement of axillary lymph nodes, and receptor status. It relates to 15% of cancer-related mortality in female patients. (3) The majority of patients present between the ages of 40 and 50 years, but these days, this cancer is more prevalent in young people. (4) The presentation of breast carcinoma varies. Mainly, it presents as a lump in the breast, but it can also present as nipple discharge, skin discoloration, skin or nipple retraction, and mastalgia. (5) The main risk factors included nulliparity, hormone replacement therapies, advancing age, female gender, delayed marriages, and congenital predisposition. Multiple tumor suppressor genes and proto-oncogenes play roles in the progression of disease. (6)

Axillary lymph nodes are the most common site of metastasis in cases of breast carcinoma. (7) Therefore, the involvement of axillary lymph nodes is one of the most critical factors in the prognosis of breast cancer, especially in early breast cancers (8). The greater the involvement of axillary lymph nodes, the greater the risk of reoccurrence and mortality. Lymph node involvement has a significant impact on the treatment outcome of breast cancer patients (9). Therefore, this research will be conducted to evaluate the statistical association between the size of the breast lump and the presence of lymph nodes. It will help us determine the site-specific frequency of axillary lymph node positivity in a malignant breast lump and also help us to classify the malignant breast lump according to its clinic-demographic features. In this way, we will add literature about

the different aspects of breast carcinoma so that future studies will be conducted on this cancerous disease.

Methodology

This observational cross-sectional study was conducted in Shaikh Zayed Hospital, Lahore's general surgery and surgical oncology unit. A sample of 165 patients was collected using a non-probability consecutive sampling technique. Inclusion criteria include: All females with age above 18 years, A variable-duration palpable breast lump, and Individuals with axillary lymph nodes that may be palpable or not. Exclusion criteria include Individuals experiencing acute, painful breast lumps, such as breast abscesses, a bilateral breast mass, a Lump that turned out to be benign, and Individuals who had previously undergone neoadjuvant radiochemotherapy.

This study used the ethical principles outlined in the Declaration of Helsinki and was approved by the local institutional review board. Patients with palpable or radiological evidence of breast lumps above 18 years of age visiting the outdoor, emergency, and indoor departments of general surgery and the surgical oncology unit of Sheikh Zayed Hospital Lahore were evaluated for enrollment in the study by taking their histories. Those meeting the exclusion criteria were excluded; a detailed examination evaluated the rest. A true-cut biopsy was performed in all cases, and only those patients were included in this research who had a histologically proven malignant breast lump. The maximum length of each side determined the size of the breast lump. Lymph node positivity was assessed clinically and radiologically. The site of the breast lump was noted. The laterality of malignant breast mass was evaluated. Consistency of the lump was assessed in the form of hardness, firmness, and softness, whereas fixity was noted in the form of mobility and fixation to skin or underlying tissue. To decrease the bias in our study, all procedures and



examinations were done under the supervision of consultants. All the data was collected in pre-defined processes. All identifying information was kept confidential. Data was analyzed by using SPSS software, and p-value less than 5 considered statistically significant.

Results

In this study, the mean age of patients presented with breast cancer was 45.45 years + 6.31 years, and the mean size of malignant breast lump was 3.57 cm + 0.84 cm.

The most common size of breast lump was between 2-5 cm 146/165 (88.48%), followed by >5cm (7.28%) and <2 cm (4.24%).

Most of the breast lump was left-sided (55.15%) as compared to the right side (44.85%)

As shown in Table 1, the most common site of breast lump presentation was the upper lateral quadrant (62.21%), followed by the upper medial quadrant (16.36%). The least common site was the central (3.03%).

The data regarding the number of lymph node positivities was stratified for laterality, lump size, lump site, and lump consistency. Results showed that the size and consistency of the lump had a statistically significant relation with the number of lymph node positivities, as their p-values were less than 0.05. Data are shown in Tables 2, 3, 4, and 5.

Table 1: Nurses’ Professional and Demographic Details

		FREQUENCY	PERCENTAGE
SIZE OF LUMP	<2 cm	7	4.24%
	2-5 cm	146	88.48%
	>5 cm	12	7.28%
	Total	165	100%
LATERALITY OF LUMP	Right-sided	74	44.85%
	Left-sided	91	55.15%
	Total	165	100%
NUMBER OF LYMPH NODE POSITIVITY	0	20	12.12%
	1-3	27	16.36%
	4-9	75	45.45%
	>10	43	20.06%
	Total	165	100%
SITE OF LUMP	Upper lateral quadrant	101	61.21%
	Upper medial quadrant	27	16.36%
	Lower lateral quadrant	18	10.91%
	Lower medial quadrant	14	8.48%
	Central	5	3.03%
	Total	165	100%
CONSISTENCY OF LUMP	Hard	124	75.15%
	Firm	36	21.82%
	Soft	5	3.03%
	Total	165	100%

Table 2 Stratification of the size of the lump concerning the number of lymph node positivity

SIZE OF LUMP		NUMBER OF LYMPH NODE POSITIVITY	FREQUENCY	PERCENTAGE	P-VALUE
SIZE OF LUMP	<2 CM (7)	0	7	4.24%	0.0001
		1-3	0	0.00%	
		4-9	0	0.00%	
		>10	0	0.00%	
		Total	7	4.24%	
	2-5 CM (146)	0	13	7.89%	
		1-3	24	14.54%	
		4-9	73	44.24%	
		>10	36	21.81%	
	>5 CM (12)	0	0	0.00%	
		1-3	3	1.82%	
		4-9	2	1.21%	
		>10	7	4.24%	
Total		12	7.28%		
Total			165	100%	

Table 3 Stratification of consistency of lump concerning the number of lymph node positivity

CONSISTENCY OF LUMP	HARD (124)	NUMBER OF LYMPH NODE POSITIVITY	FREQUENCY	PERCENTAGE	P-VALUE	
		0	5	3.03%		0.00001
		1-3	19	11.51%		
		4-9	67	40.61%		
	>10	33	20.00%			
	FIRM (36)	0	11	6.67%		
		1-3	7	4.24%		
		4-9	8	4.85%		
		>10	10	6.06%		
	SOFT (5)	0	4	2.42%		
		1-3	1	0.60%		
		4-9	0	0.00%		
		>10	0	0.00%		
Total		165	100%			

Table 4 Stratification of the site of the lump concerning the number of lymph node positivity

SITE OF LUMP	UPPER LATERAL QUADRANT (101)	NUMBER OF LYMPH NODE POSITIVITY	FREQUENCY	PERCENTAGE	P-VALUE	
		0	13	7.88%		0.98
		1-3	17	10.30%		
		4-9	45	27.27%		
	>10	26	15.76%			
	UPPER MEDIAL QUADRANT (27)	0	3	1.82%		
		1-3	4	2.42%		
		4-9	13	7.88%		
		>10	7	4.24%		
	LOWER LATERAL QUADRANT (18)	0	2	1.21%		
		1-3	3	1.81%		
		4-9	10	6.06%		
		>10	3	1.82%		
	LOWER MEDIAL QUADRANT (14)	0	1	0.60%		
		1-3	1	0.60%		
		4-9	7	4.24%		
		>10	5	3.03%		
	CENTRAL (5)	0	1	0.60%		
		1-3	0	0.00%		
		4-9	2	1.21%		
		>10	2	1.21%		
Total		165	100%			

Table 5 Stratification of laterality of lump concerning the number of lymph node positivity

LATERALITY OF LUMP	RIGHT-SIDED (74)	NUMBER OF LYMPH NODE POSITIVITY	FREQUENCY	PERCENTAGE	P-VALUE	
		0	8	4.85%		0.53
		1-3	12	7.27%		
		4-9	36	21.81%		
>10	18	11.51%				

		>10	15	9.09%
	LEFT-SIDED (91)	0	12	7.27%
		1-3	15	9.09%
		4-9	39	23.64%
		>10	28	16.97%
		Total	165	100%

Discussion

In our study, the mean age of patients presented with breast cancer was 45.45 + 6.31 years. Similarly, in the article, Chopra et al. state that the mean age of patients presented with breast cancer was 50.1 years + 10.5 years, and most of the patients presented with carcinoma breast were between the age group of 41-50 years. (10). Similarly, another article showed that the average age of a patient with breast carcinoma was 54.17 years + 13.11 years. These results were comparable with our data. (11).

In our research, the mean size of malignant breast lumps was 3.57 cm + 0.84 cm. In contrast to Paul B. et al., the mean size of malignant breast lumps was 1.1 cm. (12).

In our study, most of the patients presented with breast cancer had lump sizes between 2-5 cm (88.48%), and only 7.28% of patients had lump sizes >5 cm. Similar results were shown by Chand et al. According to this article, the most common range of breast lump size was 2-5 cm (90%), followed by >5 cm (6%). These results were comparable with our study. (13). In contrast, in Vasitha A. et al., only 24% of patients presented with a lump size of 2-5 cm, and most of the patients presented with a breast lump size of <2 cm (69%)(14).

According to our research, the most common site of breast cancer was the upper outer quadrant at 61.21%, followed by the upper medial quadrant at 16.36%, and only 8.48% presented with the lower medial quadrant. Similarly, M Omar et al. found the most common site of breast lump was the upper outer quadrant (42.2%). (15). According to S. Chan et al., the most frequent site of breast cancer was the upper outer quadrant (60.9%)(16). Similarly, according to P. Chand et al., the most common site of breast cancer was the upper outer quadrant, and the least common site was the lower medial quadrant. (13) These results are comparable with ours.

Our study showed that most of the patients presented with breast cancer had a left-sided lump (55.15%), and the consistency of the mass was hard (75.15%). Similarly, according to S A Saad et al., most of the patients presented with breast cancer had a left-sided mass with a left-to-right ratio of 1.06. (17) Similarly, A Z Koto et al. found the percentage of left-sided breast cancer was 55.3% in comparison with right-sided breast cancer, 44.7%. (18) These results are comparable with our data.

In our research, the data is statistically significant for the size and consistency of breast lumps and the number of lymph node positivities. This showed that greater lump size is associated with a more substantial number of lymph nodes and early breast cancer metastasis. Similarly, if the consistency of breast mass is more complex, it is associated with higher lymph node positivity. Similar results are seen by Chand et al.(13), C L Carter et al. (19), and JS Michaelson et al.(20).

Conclusion

Most breast cancers are left-hand-sided with size ranges between 2-5 cm. The mean age of presentation of patients presented with breast cancer is 45.45 years + 6.31 years, and the mean size of a malignant breast lump is 3.57 cm + 0.84 cm. Lymph node positivity is an independent risk factor for the survival of breast cancer patients.

Tumor size and tumor consistency are directly related to the number of lymph node positivities.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned.

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

MB (Trainee Registrar)

Manuscript drafting, Study Design, Review of Literature, Data entry, Data analysis, drafting article.

MIA (Professor)

Conception of Study, Development of Research Methodology Design, Study Design, manuscript review, Manuscript revisions, critical input.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Lacey Jr JV, Devesa SS, Brinton LA. Recent trends in breast cancer incidence and mortality. *Environmental and molecular mutagenesis*. 2002;39(2-3):82-8.
2. Li C, Uribe Da, Daling J. Clinical characteristics of different histologic types of breast cancer. *British journal of cancer*. 2005;93(9):1046-52.
3. Russo J, Frederick J, Ownby HE, Fine G, Hussain M, Krickstein HI, et al. Predictors of recurrence and survival of patients with breast cancer. *American journal of clinical pathology*. 1987;88(2):123-31.
4. Kumar R, Abreu C, Toi M, Saini S, Casimiro S, Arora A, et al. Microbiology and treatment of breast cancer in young women. *Cancer and Metastasis Reviews*. 2022;41(3):749-70.
5. You JY, Park S, Lee E-G, Lee ES. Detection and Diagnosis of Breast Cancer. *A Practical Guide to Breast Cancer Treatment*: Springer; 2023. p. 1-17.
6. Krum-Hansen S. A Systems Epidemiology Approach to Breast Cancer and Parity. *The Norwegian Women and Cancer (NOWAC) Study*. 2024.

7. Jatoi I, Hilsenbeck SG, Clark GM, Osborne CK. Significance of axillary lymph node metastasis in primary breast cancer. *Journal of Clinical Oncology*. 1999;17(8):2334-.
8. Patani N, Dwek M, Douek M. Predictors of axillary lymph node metastasis in breast cancer: a systematic review. *European Journal of Surgical Oncology (EJSO)*. 2007;33(4):409-19.
9. Veronesi U, Galimberti V, Zurrada S, Merson M, Greco M, Luini A. Prognostic significance of number and level of axillary node metastases in breast cancer. *The Breast*. 1993;2(4):224-8.
10. Chopra B, Kaur V, Singh K, Verma M, Singh S, Singh A. Age shift: Breast cancer occurs in younger age groups. *Clin Cancer Investig J*. 2014;3(6):2278-0513.142652.
11. El-Tamer MB, Wait RB. Age at presentation of African-American and Caucasian breast cancer patients. *Journal of the American College of Surgeons*. 1999;188(3):237-40.
12. Gordon PB, Goldenberg SL. Malignant breast masses are detected only by ultrasound. A retrospective review. *Cancer*. 1995;76(4):626-30.
13. Chand P, Singh S, Singh G, Kundal S, Ravish A. A study correlating the tumor site and size with the level of axillary lymph node involvement in breast cancer. *Nigerian Journal of Surgery*. 2020;26(1):9-15.
14. Abey Suriya V, Chandrasena L. Clinical and histological characteristics of breast lumps: A 20-year single private sector tertiary care center experience. *Journal of the Postgraduate Institute of Medicine*. 2023;10(2):1-7.
15. Omer AM, Alrehili NA, Almughamsi RK, Aljurfi HM, Setaih HS, Gareeballah A, et al. Characterization of breast lumps locations using high-frequency ultrasound: Correlation between Doppler vascularity and BI-RADS. *Journal of Radiation Research and Applied Sciences*. 2023;16(4):100661.
16. Chan S, Chen J-H, Li S, Chang R, Yeh D-C, Chang R-F, et al. Evaluation of the association between quantitative mammographic density and breast cancer occurred in different quadrants. *BMC cancer*. 2017;17:1-11.
17. Al-Saad S, Al Shenawi H, Almarabbeh A, Al Shenawi N, Mohamed AI, Yaghan R. Is laterality in breast Cancer still worth studying? Local experience in Bahrain. *BMC cancer*. 2022;22(1):968.
18. Koto M, Becker J, Mokone-Fatunla D, Mundawarara S, Bondo M. Laterality of breast cancer at Dr George Mukhari academic hospital. *South African Journal of Surgery*. 2019;57(3):55-61.
19. Carter CL, Allen C, Henson DE. Relation of tumor size, lymph node status, and survival in 24,740 breast cancer cases. *Cancer*. 1989;63(1):181-7.
20. Michaelson JS, Silverstein M, Sgroi D, Cheongsiatmoy JA, Taghian A, Powell S, et al. The effect of tumor size and lymph node status on breast carcinoma lethality. *Cancer: Interdisciplinary International Journal of the American Cancer Society*. 2003;98(10):2133-43.



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, <http://creativecommons.org/licenses/by/4.0/>. © The Author(s) 2025