Original Research Article

A Study Of Correlation Between Size Of Tumour And Involvement Of Axillary Lymph Nodes In Cases Of Breast Cancer At A Tertiary Care Centre Of Bihar

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Abstract

Breast cancer is the leading cancer in women, accounting for 25% of all cancer cases worldwide. It is more common in developed countries. Outcomes for breast cancer vary greatly depending on the cancer sub-type, stage of disease, and person's age. The most common histologic type of breast cancer is infiltrating ductal carcinoma. The mainstay of breast cancer treatment is surgery when the tumor is localized, followed by chemotherapy as well as radiotherapy (when indicated) and for estrogen receptor (ER) and progesterone receptor (PR)-positive tumors, adjuvant hormonal therapy. **Methodology:** An observational study was conducted on 20 female patients of carcinoma breast by the Department of Surgery at Darbhanga Medical College & Hospital, Laheriasri, Bihar. The study duration was January 2020 to December 2020. Ethical clearance was obtained from the Institutional Ethics Committee. Informed consent forms were each patient before participation. **Result:** The present study of showed that 3 out of 20 cases belonged to 40-50 years, majority were in the age range of 51-60 years and another 5 cases were >60 years age group. Lymph node involvement based on age of the patients. **Conclusion:** This study concludes that there is a higher incidence of lymph node positivity with increasing size of the breast tumours.

Keywords: Breast Cancer, Size Of Tumour, Axillary Lymph Nodes

Introduction

Breast cancer is the leading cancer in women, accounting for 25% of all cancer cases worldwide.[1] It is more common in developed countries.[2] Outcomes for breast cancer vary greatly depending on the cancer sub-type, stage of disease, and person's age. The most common histologic type of breast cancer is infiltrating ductal carcinoma.[3] The mainstay of breast cancer treatment is surgery when the tumor is localized, followed by chemotherapy as well as radiotherapy (when indicated) and for estrogen receptor (ER) and progesterone receptor (PR)-positive tumors, adjuvant hormonal therapy.[3,4]More than two-thirds of breast cancer cases are diagnosed in women aged 50 years and older; the majority of these cases are in developed countries. For women aged 15–49 years, twice as many breast cancer cases are diagnosed in developing countries than in developed countries. In countries where mammography is available and affordable, adherence to recommendations for routine screening is associated with reduced mortality from breast cancer.[5]The increased use of mammographic screening has led to an increase in the detection of breast tumors that measure ≤2.0 cm (American Joint Committee on Cancer [AJCC] classification T1).[6-8]Axillary node status remains the most important predictor of outcome in breast cancer patients. Data clearly show that women with cancer-free lymph nodes (lymph node-negative) have better survival than women with cancerous nodes (lymph node-positive). As the number of positive nodes increases, survival decreases.[9]The axillary lymph nodes (ALN) are staged to aid in determining prognosis and therapy. Sentinel lymph node biopsy (SLNB) is the initial standard axillary staging procedure performed in women with invasive breast cancer. Reports demonstrate a 97.5%–100% concordance between SLNB and complete ALN dissection (ALND).[10-15]Tumors may be measured clinically or pathologically. Axillary nodal involvement is an essential prognostic factor in patients with breast cancer. The presence of positive ALNs implies the need for systemic adjuvant chemotherapy and locoregional irradiation. Hence, ALND contributes to the accurate staging of the disease.[16]The characteristics of the primary breast cancer closely associated with ALN metastasis are tumor size, tumor grade, and lymphovascular invasion, but only tumor size can be determined preoperatively.[17-19]

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The presence of axillary node metastasis and the size of the primary tumor are the two main prognostic factors used clinically for the evaluation of breast cancer patients.[20] "Clinically node-positive" patients will undergo ALND without undergoing SLNB. "Clinically node-negative" patients with T1 or T2 tumors currently undergo SLNB. If the SLNB results are negative, no further axillary dissection is done because there is no survival benefit for performing ALND in this setting.[21-24]The more lymph nodes that contain cancer cells, the more serious cancer might be. Hence, doctors use the number of involved lymph nodes to help make treatment decisions.[25] After the surgery, a pathologist looks at the cells from breast cancer as well as from the lymph nodes.

With this background, a study was planned to correlate tumor size with the level of ALN involvement (ALNI) (lymph node-positive) in early and locally advanced breast cancer at a tertiary care centre of Bihar.

Methodology

An observational study was conducted on 20 female patients of carcinoma breast by the Department of Surgery at Darbhanga Medical College & Hospital, Laheriasri, Bihar. The study duration was January 2020 to December 2020. During this period females with a confirmed diagnosis of carcinoma breast were considered for the study. Ethical clearance was obtained from the Institutional Ethics Committee. Informed consent forms were each patient before participation.

Inclusion criteria: Early (Stage IIB) and locally advanced breast cancer (Stage IIB till IIIB).

Exclusion criteria: Metastatic disease, Tx, Nx patients as per AJCC tumor, node, and metastasis (TNM) staging and T_o, N1 patients as per AJCC TNM staging.

Assessment of tumor size

Tumor size was assessed clinically as well as ultrasonographically for all the patients and the longest dimension in length, width, or depth was taken for size consideration. The final size as described by histopathologists on grossing for all the patients was taken into correlation and this parameter was taken finally for all the patients.

Lymph node status of the axilla

The axilla was assessed clinically, ultrasonographically, and intra-operatively for lymph nodes and statistically compared with each other.

Intraoperatively, lymph nodes up to level III of the axilla were dissected with the axillary fat.The axillary fat was then dissected for visible ALNs.These nodes were counted and sent for histopathological assessment, and the final status of axilla was taken to be provided by the histopathological assessment.The patients were then staged according to the TNM staging by AJCC.[26]

Statistical analysis: The data collected from the autopsies were entered and analyzed using Statistical Package for Social Sciences (SPSS) ver. 20.0. Inferential statistics was done. Chi-square test was used to find association between the variables.

Results

A total of 20 cases of early and locally advanced breast cancer were included in the study to develop a correlation between sizes of tumor with lymph node involvement based on various criteria.

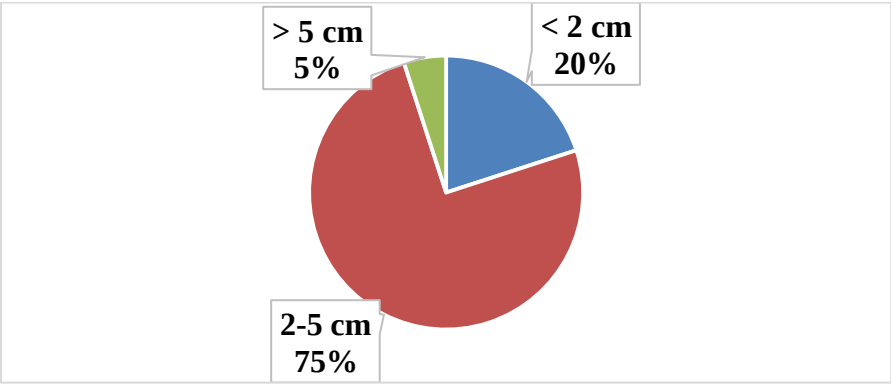

Fig 1: Pie diagram showing distribution of study participants based on size of tumors

The present study of showed that 3 out of 20 cases belonged to 40-50 years, majority were in the age range of 51-60 years and another 5 cases were >60 years age group. Lymph node involvement based on age of the patients has been shown in table 1.

Table 1: Age of patient and number of lymph nodes

Age group (years)	Number	Lymph node involvement			
		0	1-3	4-9	>9
40-50	3	1	2	0	0
51-60	12	1	1	8	2
>60	5	1	1	2	1

Correlation between size of tumor and lymph node involvement determined by clinical examination was also looked out for. (Table 2)The ALNI increased significantly (P = 0.008) as the tumor size increased as shown by our study.

Table 2: Correlation between size of tumor and lymph node involvement on clinical examination

Size of the tumor	Number	Clinical examination for ALNI	
		Present	Absent
< 2 cm	4	1	3
2-5 cm	15	11	4
>5 cm	1	1	0

Based on preoperative tumor size (on ultrasonography) with lymph node involvement determined on postoperative HPE, it was observed that out of the four patients with tumor size <2 cm, none had the involvement of lymph nodes. While among remaining 15 cases with tumor size between 2 cm and 5 cm, 1 case had no lymph nodes involved, 7 had 1–3, 5 had 3–9, and 2 cases had more than 10 lymph nodes involved. Of 1 patient with tumor size more than 5 cm, it was seen that the patient had more than 10 lymph nodes involved. Using the Pearson Correlation test, we found that preoperative ultrasonographic-determined tumor size had a positive correlation of 0.890 to the final histopathological Tumor size ($P < 0.001$), which implies that ultrasound was a good tool to objectively measure tumor size before the surgery.Thus, predicting that with an increase in tumor size, number of lymph nodes involved increases[27]

Discussion

The present study of breast carcinoma showed that 46% of cases belonged to 51–60 years of age group, 42% to 40–50 years age group and 12% to > 60 years age group. These findings showed that most of the breast cancer in our study was of the age group 40–60 years (88%) and locally advanced type. In a study by Chopra *et al*.conducted in 100 patients of histopathologically confirmed breast cancer, the mean age of patients was 51 years (standard deviation = 10.48).

In a study by Kumar and Mukherjee when lymph node status and size of the tumor were correlated, it was found that 26 out of 50 (52%) patients were of N1. T2, T3, and T4 showed an increase in lymph node positivity as three out of five (60%) in the T3 were of N2 lymph node status, whereas all of T4 were of N3 lymph node status. Legha *et al*.found that as the average size of the breast tumor increases, so does the average number of lymph nodes, both clinically as well as histopathologically positive for metastasis. It was also seen that as the number of lymph nodes increased, so did the size of the tumor by both clinical and histopathological examination.

Similar to the findings of Chan *et al*.,we also found that preoperative ultrasonographically determined tumor size was similar to the final histopathological T stage which implies that ultrasound was a good tool to objectively measure tumor size before the surgery and this is particularly useful in hospitals without radio nuclear medicine expertise for SLN imaging. Furthermore, the preoperative determination of tumor size with ultrasound correlates well with the actual level of ALNI. Therefore, tumor size can be used to guide the surgeon to more limited axillary dissection as an alternative to SLNB for T1-node negative breast cancers.

Conclusion

This study concludes that there is a higher incidence of lymph node positivity with increasing size of the breast tumours.

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