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## The Prognostic Significance of Location, Number, Grade and Degree of Involved Axillary Lymph Nodes in Breast Cancer

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### Abstract

Most breast cancers appear to involve regional lymph nodes sooner than spreading elsewhere. The more information concerning the details of axillary lymph node involvement, the clearer becomes the prognostic separation. The location of the positive nodes is prognostically as important as their number and the degree of cancer involvement in individual lymph nodes. A comparison was done for the axillary lymph node involvement in one hundred female patients with breast carcinoma who were diagnosed in the pathology lab and group practice of Suez Canal University, faculty of Medicine.

### Introduction

**BREAST** cancer is the most common tumor seen in Egypt. It represents 25.5% of female cancers [1]. Nowadays, there are wide varieties of therapeutic modalities that the clinician can use for tumor control. The management of their patients is no longer the concern of only the surgeons and oncologist. The trend of modern pathologist is to be an active member of the treating team. His task is not only to classify the tumor, but also to evaluate the local and regional spread and to foresee the evolution of the disease [2].

The relationship between the level of involvement and the prognosis seems to be

separate from the numerical aspect of lymph node involvement, although obviously there is a correlation between the two. Examination of the axilla by levels not only has the advantage of dividing patients into four prognostic groups but also gives more reproducible results with less effort than evaluation by total node count. The two edges of the pectoralis minor muscles has been used as the boundaries [3]:

Level 0 with no lymph node  
Level I with nodes below the muscles  
Level II with nodes beneath the muscles  
Level III with few apical nodes above the muscles

Another quantitative measure has been shown to affect the prognosis: that is the

degree of involvement by cancer tissue of individual lymph node. Hultborn and Tornberh [4], concluded that the prognosis is substantially poor if the cancer has grown sufficiently to break through the capsule of the nodes. This was later contradicted by workers who denied the presence of any relation [5].

The 5 years survival rate of breast cancer, as a whole, is 45%. However, its evaluation is frequently unexpected, being quite favorable in some types and giving rapid metastatic deposits in another [6]. Previously, when treatment of breast cancer was limited to surgery, the pathologist had only to differentiate between benign and malignant tumors. Eventually, application of radiotherapy has led to certain changes in loco- regional and nodal management. Nowadays with chemotherapy, as well as with hormonal and immunotherapy, it is necessary to take into consideration other clinical and pathological criteria. It worth trying to distinguish the patients with good prognostic factor, who do not have to receive aggressive therapy, from those presented initially with poor prognosis and should not be untreated [7].

The aim of this work is to find out the prognostic significance of size of the tumour, number, location, grade and degree of involved axillary lymph nodes in breast cancer.

#### Patients and Methods

This study included 100 female patients with both clinically and pathologically diagnosed breast cancer. Their ages ranged between 28 and 69 years (M = 48.5). All the patients were subjected first to excisional biopsy for diagnosis then to total mastectomy and axillary lymph node clear.

The axillary lymph nodes involved were localized, oriented and described both anatomically during operation and pathologically after receiving the specimen.

The number of lymph nodes and the level of involvement of each patient was identified.

After gross pathological description of the localized lymph node, they were cut into thin sections, fixed, processed and stained by hematoxylin and eosin.

The degree of involvement of each lymph node was measured and were divided into 4 groups:

- 1- No involvement
- 2- Subcapsular or focal involvement
- 3- Subtotal or total involvement
- 4- Extracapsular involvement (perinodal).

The tumor grading [8] and staging [9] were identified.

Patient with stage I & II breast cancer received a radiotherapy for the lymph node bearing area (3 internal mammary, axillary and supraclavicular lymph nodes) 5000 CGY/5w Co<sup>60</sup> and for chest wall, 5000 CGY/5w DXR.

All patients received chemotherapy in the form of:

(a) *If premenopausal:*

CMF regime to be repeated every 4 weeks for 6 courses.

Cyclophosphamide 1000 mg/m<sup>2</sup> surface area/ day per oral days 1 to 14.

Methotrexate 40 mg/m<sup>2</sup> surface area IV days 1 + 8.

5 Fluorouracil 600 mg/m<sup>2</sup> surface area IV days 1 + 8.

(b) For post menopausal:

Tamoxifen citrate (nolvadex)

10 mg tablet twice daily for 2 years then follow up.

**Results**

The 5 year survival rate was taken as the prognostic factor in different groups of patients.

It was found that there was negative correlation between the five years survival rate and the pathological grade of the tumour (table 1, Fig. 1).

The relation between the number of involved lymph nodes and the 5 years survival rate was found to be negative as shown in table 2, Fig. 2.

There was steady decrease of 5 years survival rate with the increased level of involvement of axillary lymph nodes (Table 3, Fig. 3).

Also there was steady decrease in 5 years survival rate and the increase in the degree of involvement of individual node by malignant cells (Table 4, Fig. 4) ( $\chi^2 = 2.12 - p < 0.05$ ).

The five years survival rate decreased with the larger size of the tumor. The difference was found statistically significant (Table 5, Fig. 5).

Table (1): The Relation between the Pathological Grade of the Tumor and 5 Years Survival Rate.

Grade	No. of survival after 5 years		No. of death in 5 years		Total	
	No.	%	No.	%	No.	%
0	5	83.3	1	16.7	6	100
I	5	50	5	50	10	100
II	10	41	14	59	24	100
III	21	35	39	65	60	100
Total	41	41	59	59	100	100

$\chi^2 8.68 \quad p < 0.05$

Table (2): The Relation between the Number of Lymph Nodes Involved and the 5 Years Survival Rate.

No. of l. nodes	Survival after 5 years		Death in 5 years		Total	
	No.	%	No.	%	No.	%
0	8	66.7	4	33.3	12	100
< 3	10	45.5	12	54.5	22	100
3-5	13	37.1	22	62.9	35	100
> 5	10	32.3	21	67.7	31	100
Total	41	41	59	59	100	100

$\chi^2 4.64 \quad p < 0.05$

Table (3): The Relation between the Level of the Involved Axillary Lymph Nodes and the 5 Years Survival Rate.

Level	Survival after 5 years		Death in 5 years		Total	
	No.	%	No.	%	No.	%
0	8	66.7	4	33.3	12	100
I	19	51.4	18	48.6	37	100
II	11	32.3	23	67.7	34	100
III	3	17.6	14	82.4	17	100
Total	41	41	59	59	100	100

$\chi^2 9.79 \quad p < 0.05$

Table (4): The Relation between the Degree of Involvement of Lymph Node and the 5 Years Survival Rate.

Degree	Survival after 5 years		Death in 5 years		Total	
	No.	%	No.	%	No.	%
No lymph node	8	66.7	4	33.3	12	100
Subcapsular or focal	9	50	9	50	18	100
Subtotal or total	20	33.9	39	66.1	59	100
Extranodal	4	27.3	7	72.7	11	100
Total	41	41	59	59	100	100

$\chi^2 2.12 \quad p < 0.05$

Table (5): The Relation between the Size of the Tumour and 5 Years Survival Rate.

Size of the tumor	Survival after 5 years		Death in 5 years		Total	
	No.	%	No.	%	No.	%
No mass	1	100	0	0	1	100
Less than 2 cm	4	50.1	4	50	8	100
2-5 cm	32	40.5	47	59	79	100
More than 5 cm	4	33.3	8	66.7	12	100
Total	41	41	59	59	100	100

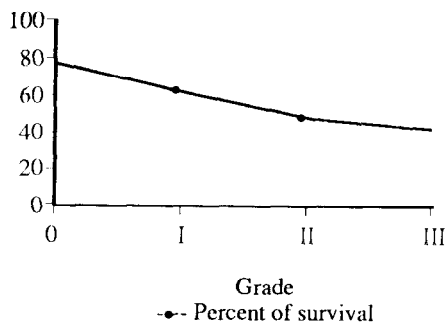


Fig. (1): The relation between the grade and 5 years survival rate.

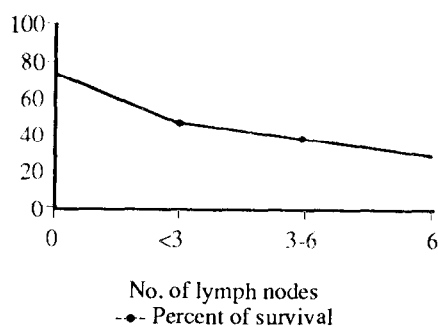


Fig. (2): Relation between the No. of the lymph nodes involved and the 5 years survival rate.

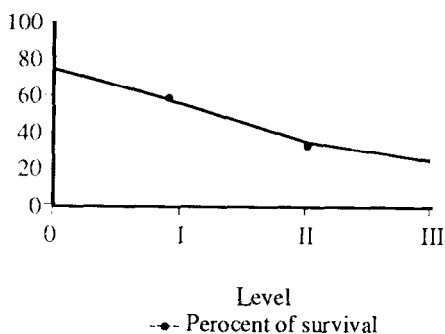


Fig. (3): Relation between the level of involved axillary l.n. and the 5 years survival rate.

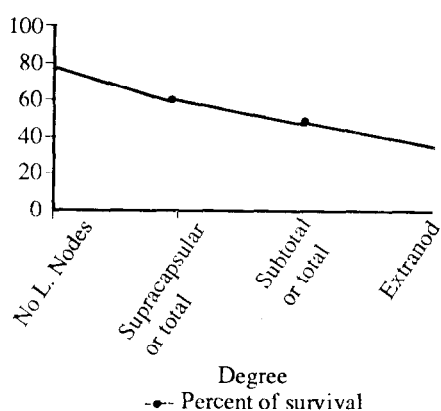


Fig. (4): The relation between the degree of involved l.n. and the No. of surv. after 5 yrs.

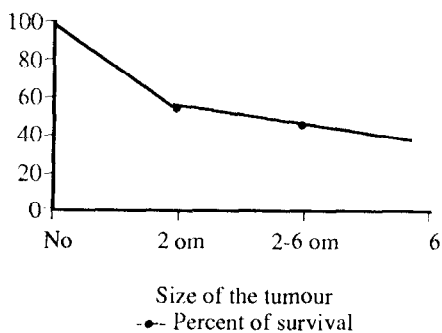


Fig. (5): The relation between the size of the tumour and 5 years survival.

### Discussion

Many studies were done all over the world to estimate the prognostic value of the tumor size and nodal status in breast cancer. These studies formed the base for TNM staging which was adopted by the American joint committee on cancer and the International Union Against Cancer. That base did not include or even consider the level of involved lymph nodes.

In this study, we found a strong correlation between the level of lymph node involvement and the prognosis of cancer breast patients.

Although we still appreciate, through evidence, that the size of the tumor and the number of the involved lymph nodes are still valid prognostic measures, yet the level of lymph node involvement has shown, in our study, a more relevant, steady and reliable correlation than the rest of the measures.

By looking through Figs. (1 to 5), we can notice the linear correlation between the level of lymph node involvement and five years survival (Fig. 3) among the less regular, curve correlation of the other indicators.

These findings, in fact, contradict those of Carter and his colleagues [10] who found no significant statistical correlation between the prognosis and the level involved lymph nodes.

The size of the tumor as a prognostic factor is still a controversial issue. Although Carter and his colleagues [10] found a linear correlation between the tumor size and prognosis regardless to the presence of lymph nodes, yet Reger and his colleagues [11] gave more relevance and importance to the lymph node status. Vallagussa and his colleagues [12] denied the effect of tumor size on prognosis in node negative patients .

In this study we found the size of the tumor as a prognostic indicator, although still a valid indicator, yet the least reliable.

#### *Conclusion:*

We found a significant correlation between the level of lymph node involvement and cancer breast prognosis.

We recommend considering this factor as one of the prognostic indicators in breast cancer patients.

The tumor size, number and quantity of

lymph node involvement remain important prognostic variables associated with survival in breast cancer.

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