

# EARLY EXPERIENCE OF SENTINEL LYMPH NODE BIOPSY IN BREAST CANCER

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## ABSTRACT

*Objective* To assess the results of sentinel lymph node biopsy in breast cancer.

*Study design* Case Series

*Place & Duration of study* Surgical Ward 3, Jinnah Postgraduate Medical Centre Karachi, from April 2007 to March 2009.

*Patients and Methods* In this study patients with biopsy proven carcinoma breast and clinically negative lymph nodes in the axilla were included. Patients with history of previous breast surgery, clinically palpable lymph nodes, Stage IV disease, bleeding disorders, chronic liver disease or history of allergic reaction to the dye were excluded. The study patients underwent sentinel lymph node mapping and dissection. One ml of gentian violet or methylene blue dye injected into the peritumoral area followed by one minute massage. Simple mastectomy or wide excision with axillary clearance was done after 30 minutes of injection.

*Results* This study was conducted on 35 patients with the age range from 28 years to 68 years. In all the patients diagnosis was infiltrating ductal carcinoma. Wide local excision with axillary clearance was possible in only two patients with clinically stage 1 disease. In rest of the patients simple mastectomy with axillary clearance was done. According to the tumor size; T1 was observed in 15 patients, T2 in nine, T3 in six and T4 in five patients. In all patients (n 15) with T1 tumor, stained lymph node was positive in eight patients while tumor metastasis in the remaining lymph nodes removed by axillary clearance showed involvement in six patients. In patients with T2 masses, tumor involvement was seen in both groups of lymph nodes in six patients. In three patients with T4 tumor, sentinel lymph nodes were negative for tumor metastasis however in rest of the lymph nodes tumor involvement was seen in four patients. In patients with T3 masses, three showed involvement of the entire axillary lymph node group and sentinel lymph node as well.

*Conclusions* If sentinel lymph node is involved by the tumor, axillary clearance should be done irrespective of the tumor size. Sentinel node biopsy should be avoided in patients with T4 lesions.

*Key words* Sentinel lymph node, Breast cancer.

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## INTRODUCTION:

Sentinel node (SN) localization is the second most important development in this century after conservative lumpectomy for the treatment of early breast cancer. The concept of this technique is intimately embedded in the notion that, as a consequence of the orderly

pattern of lymph flow, metastatic spread of solid tumors through the lymphatics follows a predictable pattern.<sup>2</sup> Therefore on this assumption that histological evaluation of the SN increases the likelihood of detecting metastasizing tumor cells, this method is most widely used for both palpable and non-palpable breast tumors with clinically negative axilla. However, this technique is also applied in patients with locally advanced breast cancer and after neoadjuvant chemotherapy.

Most of the initially identified potential contraindications towards the procedure, such as non palpability, large tumor size, pregnancy and being previously operated in the breast or axilla, have been ruled out, whereas multi-focal involvement represents an unsolved problem.<sup>3</sup> This technique of SN biopsy therefore spares patients who have no trace of disease in their sentinel nodes from the sometimes severe complications of having an entire nodal basin removed like chronic swelling, discomfort, infection, and reduced mobility. Also, the low rate of clinical axillary recurrence after an intermediate follow up period suggests that a negative SN biopsy accurately reflects the nodal stage in patients with breast cancer.<sup>4</sup>

This study was carried out to identify the role of sentinel lymph node biopsy enabling us to omit the unnecessary axillary dissection in node negative patients thereby decreasing morbidity in such cases.

#### PATIENTS AND METHODS:

This study was carried out at Surgical ward 3 of Jinnah Postgraduate Medical Centre, Karachi from April 2007 to March 2009 on female patients admitted through OPD, diagnosed as a case of (trucut biopsy proven) carcinoma of the breast with clinically negative lymph nodes in the axilla. Those with history of previous breast surgery, clinically palpable lymph nodes, Stage IV disease, bleeding disorders, chronic liver disease or history of allergic reaction to the dye were excluded from this study.

Data regarding name, age, address and stage of the disease was collected. Clinical data included age, sex and breast involved. These patients then underwent sentinel lymph node mapping in which 1 ml of a colored dye i.e. gentian violet or methylene blue was injected into the peritumoral area followed by massage for one minute. Simple mastectomy was undertaken after 30 minutes of injection of dye, followed by the axillary clearance.

Lymph nodes were divided into two groups: the dye stained lymph node as SN and the rest of the lymph nodes removed by axillary clearance. These, along with the breast specimen were sent for histopathology,

marked and labeled accordingly. Pathological data included histopathological type, size of the tumor, lymph node status in sentinel and non sentinel lymph nodes. T was followed according to the TNM, UICC (T1 tumors 2cm, T2 >2-5 cm, T3 tumors >5cm and T4 tumor of any size with direct involvement of the skin or chest wall).

#### RESULTS:

This study included 35 patients with the age range from 28 years to 68 years. In all these patients the diagnosis was infiltrating ductal carcinoma on trucut biopsy. Wide local excision with axillary dissection was possible in only 2 patients with clinical stage 1 disease. In the rest of the patients simple mastectomy with axillary clearance was done. According to the tumor size, T1 was observed in fifteen patients, T2 in nine, T3 in six and T4 in five patients. In all patients (n 15) with T1 tumor, SN was positive in eight patients, while tumor metastasis in the remaining lymph nodes, removed by axillary clearance, showed involvement in six patient (table-I). In nine of the patients with T2 masses, tumor involvement was seen in both the groups of lymph nodes in six patients only. In five patient with T4 tumor, sentinel lymph nodes were positive for tumor metastasis in two patients, however, in rest of the lymph nodes tumor, involvement was seen in four patients.

**Table. I: Involvement of the lymph node groups according to the size of the tumor in Patients (n=35)**

Tumor size	No of patients	Tumor Positive in Sentinel Lymph node (No. of Patients)	Tumor positive in rest of axillary Lymph nodes (No. of patients)
T1	15	8	6
T2	9	6	6
T3	6	3	3
T4	5	2	4

#### DISCUSSION:

Incidence of breast cancer in Pakistan stands at 24.4% thus making it the commonest malignancy among Pakistani females.<sup>5</sup> This is the commonest cause of cancer related deaths globally.<sup>6</sup> Also, the presentation of breast cancer in stage III and IV is very common.<sup>7</sup> Probably, in developing country like ours, the biggest financial and psychological drain is the element of false hope, futile frantic searches for miracle treatment and collaborative faith healing by quacks and physicians alike. Economic reasons and low levels of awareness could be the other responsible factors. A strong

association is noted between low socioeconomic status and advanced disease, delay in diagnosis, limited access to minimal expected treatment and inferior disease free survival and overall survival.<sup>8</sup> This picture is completely reflected in this study despite the research period being stretched to two year, we were able to get only 35 patients with clinically negative axilla.

The management of breast cancer has passed through various stages of evolution. William Halsted's technique of radical mastectomy was to stay as the "Gold Standard" by which all other techniques were compared for half a century.<sup>6</sup> Better understanding of tumor biology, the mechanism of spread, increased awareness and improvements in screening modalities led to early detection of smaller lesions, so less extensive and breast conserving techniques gained popularity.<sup>9</sup> Over the last five years immediate breast reconstruction has become a common practice with proven medical and psychological benefit for the patients.<sup>10</sup> However limitation to these conserving procedures is presentation in late stages similar to our group of patients, thereby, restricting surgeons to do mastectomies only. Also, long-term follow-up of patients is important because many local recurrences following breast conservation therapy are late events, which therefore, is very difficult, due to non-compliance of the patients.

SN biopsy was initially developed as a technique for the detection of regional lymph node metastasis in patients with melanoma by Morton et al. The evolution of the procedure as a means to detect the presence of axillary lymph node metastasis in patients with breast cancer developed shortly thereafter. In less than 10 years following the initial reports utilizing this technique, dozens of studies have appeared in the scientific literature validating use of SN biopsy as an accurate means of detecting metastatic disease in the axillary lymph nodes in patients with breast cancer.<sup>12-15</sup> This technique has been proposed as an alternative to axillary lymph node dissection in early carcinoma breast. The presence or absence of tumor cells in the SN provides a wealth of information about the nature of a cancer and how best to treat it. Thus, it is a highly accurate minimally invasive method of staging patients. It can substantially reduce the morbidity and cost of treatment by avoiding unnecessary axillary lymph node dissection.<sup>16</sup> Although SN biopsy has become widely accepted as an alternative to routine axillary dissection for breast cancer, the reported false negative rates have varied widely, from 0% to as high as 19%.

Although studies have shown that tumor size exerted its effect on node positivity despite tumor histology or grade.<sup>17, 18</sup> However in this group of patients selected for lymph node biopsy, despite a clinically negative

axilla and smaller size of tumor, lymph nodes turned out to be positive for metastasis and larger sized tumors were negative for lymph node metastasis. This indicated involvement of other factors other than size in these patients. After multivariate analysis, studies showed histological type, tumor size, tumor site and the number of lymph nodes in the axillary specimen remained as independent predictors of the risk of nodal involvement.<sup>19</sup> Therefore, because no tumor or patient characteristics predict a high false-negative rate, all patients with T1-2 N0 breast cancer should be considered candidates for the procedure. Complete clinical examination of the axilla should be undertaken to avoid missing palpable axillary nodal metastases.

Although widely accepted for T1 lesions, its use in larger tumors remains controversial.<sup>1</sup> However sentinel lymph node biopsy may be acceptable for patients with T3 or T4b tumors, even though in these cases SN identification is lower yet SN involvement is higher than compared with T1 or T2 tumors. Systemic adjuvant therapy is also more important for patients with T3 or T4b tumors.<sup>20</sup> In this study out of five patients with locally advanced cancer three had the sentinel lymph node negative but four of the patients had lymph nodes removed after axillary clearance positive for tumor metastasis. This could be explained that probably infiltration of the skin and muscle that leads to the blockage of tumor area's usual lymphatic pathways. However this leads to the opening of other channels and hence SN was negative for tumor. It is therefore recommended that SN biopsy should not be performed in such locally advanced tumors. Also, studies have shown that SN biopsy for patients with locally advanced breast cancer after neoadjuvant chemotherapy results in a lower detection rate and higher false-negative rate.<sup>21</sup> Similarly both of these patients with negative sentinel lymphnode but presence of tumour in the rest had received neoadjuvant therapy before being operated.

#### CONCLUSIONS:

If sentinel lymphnode is positive for tumor then axillary clearance should be done irrespective of the tumor size. SN biopsy should be avoided in patients with T4 lesions.

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