

Sentinel Lymph Node Biopsy in Breast Cancer Using Methylene Blue Dye: Experience at Sir Ganga Ram Hospital Lahore

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Abstract

Background: sentinel lymph node biopsy is used widely for the management of breast cancer. Axillary lymph node involvement is a very good prognostic indicator in breast cancer. It is the first node draining the primary tumor and is the first node to be involved by the cancer.

Objectives: The purpose of this study was to find out the accuracy, sensitivity and specificity of sentinel lymph node biopsy by using methylene blue dye in our setting.

Methods: It is a case series study. The study was conducted in the surgical unit 3 Sir Ganga Ram Hospital Lahore from February 2017 to July 2018. Patients with breast lump diagnosed as breast carcinoma on needle biopsy and clinically palpable lymph nodes in axilla were subjected to sentinel lymph node biopsy using methylene blue dye. 42 patients were selected by purposive simple random technique planned for modified radical mastectomy. Sentinel lymph node biopsy was performed by injecting blue dye in sub areolar region. Mastectomy performed then axilla dissected out to find out blue stained sentinel lymph node. Stained node/nodes were taken out and placed in separate jar. Level II axillary clearance now done to complete the procedure. Both specimens were sent for histopathology. All patients are followed up till now.

Results: out of 42 patients true positive results were in 39 cases i.e metastasis detected in 16 cases in sentinel node and so in the axillary nodes, in 33 patients no metastasis found in sentinel as well as in axillary nodes, only in 3 cases false negative results seen there were no false positive cases. Sensitivity was 92% and specificity 99%.

Conclusion: Sentinel lymph node biopsy using Methylene blue dye is a safe and feasible procedure to identify the sentinel lymph node in patients of breast cancer with palpable axillary nodes. In our study this technique is proved to be effective in staining the sentinel lymph node by which unnecessary axillary dissection can be avoided in breast cancer surgery.

Keywords: Sentinel lymph Node, Breast Cancer, Mastectomy

Introduction

In the treatment of breast cancer the sentinel lymph node is an important prognostic factor and also influences the therapy. Axillary dissection can be associated with high morbidity like seroma formation, numbness, pain and lymphedema of arm [1]. Sentinel node is the first node draining the primary tumor and is the first node to be involved in case of metastasis [2]. Sentinel lymph node biopsy (SLNB) by using a vital dye i.e patent blue is a convenient and safe, intraoperatively peroperative method to assess lymph node status [3]. The current surgical standard procedure is to completely remove the involved lymph nodes from the axilla [2].

Sentinel biopsy technique was developed initially to detect metastasis in parotid gland carcinoma. It was also used in case of penile carcinoma, but now mostly used in the diagnosis of metastasis from melanoma and breast cancer [4]. Sentinel lymph node biopsy presents a new standard of care for the patients with node negative breast cancer. Whether one uses blue dye, radioisotope or both methods. It can also be performed with other dyes like indocyanine green fluoresce (ICG) and supra para magnetic iron oxide by using magnetometer [5,6]. Mapping of sentinel node is safe, feasible and accurate now [7].

In this procedure sentinel lymph node once stained by blue dye per operatively is identified, excised and sent for histo pathological diagnosis. This procedure is now recommended and practiced

worldwide for patients with breast carcinoma. There are significant reported allergic reactions in some cases with the use of isosulphane blue but reactions with methylene blue dye are very rare [8].

The study was carried out in our setting at Fatima Jinnah Medical University. Intraoperative localization of sentinel lymph node was done in 42 patients with diagnosis of breast cancer. The lymph nodes stained with blue dye were taken out, placed in a separate jar and labeled. To check and confirm that correct node is stained and taken out, routine axillary dissection performed. Both specimens sent in separate jars. The results were compared to see whether the blue stained lymph node truly represents the status of axilla and to calculate the sensitivity, specificity, positive predictive and negative predictive values.

Materials and Methods

Ethical clearance from ethical committee for research FJMU was taken for the study. It is a case series study. The study was conducted in the surgical unit 3 Sir Ganga Ram Hospital Lahore from February 2017 to July 2018. 42 Patients with breast lump diagnosed as breast carcinoma on needle or core biopsy and clinically impalpable lymph nodes in axilla i.e stage I and II were included in the study. Patients with stage III, IV and palpable axillary lymph nodes were excluded from the study. All these patients were planned for modified radical mastectomy. The patients selected for this procedure were explained the procedure in detail and informed consent taken. Sentinel lymph node biopsy was performed by injecting 1% methylene blue dye in sub areolar region at 12, o clock. And then a gentle massage performed for 5 min. at the site. Mastectomy performed as in routine then axilla dissected out to find out blue stained sentinel lymph nodes. Stained nodes were identified and taken out to be placed in separate jar. Level II axillary clearance now done to complete the procedure. Both specimens were sent for histopathology separately after labeling.

Now the results of histopathology will be analyzed to see the accuracy of identification of sentinel lymph nodes i.e if blue stained nodes was correctly stained, removed, its positive for metastasis then the same axilla should also be positive for metastasis or vice versa.

Results

Out of 42 patients in 39 cases sentinel lymph node was stained and in 3 cases it was not stained. Out of 39 stained nodes metastasis were detected in 16 cases and so in the axillary nodes, in 23 patients no metastasis found in sentinel as well as in axillary nodes.

There were only two false negative nodes i.e axilla was positive for metastasis but the stained nodes doesn't show nodal metastasis, but no false positive result i.e sentinel nodes show metastasis but axilla actually is negative as seen in our study. Mean age of the patients were 49.02 and out of 42 patients 41 patients had invasive ductal carcinoma and only one patient with lobular carcinoma. It was stage II disease in 68% and stage III 32%.

Sensitivity= TP/ TP+FN = 39 / 42 = 92%
Specificity= TN/ TN+ FP = 33/33+ 0= 100%

Positive predictive value 100 % and Negative predictive value 92%.

Discussion

In the managing breast cancer Sentinel lymph node biopsy is an approach by which arm morbidity is reduced as compared to axillary

clearance by avoiding unnecessary axillary dissection [8]. By using blue dye i.e methylene blue in the results of our study are comparable with other studies done in different countries [6].

A study was conducted by two surgeons in Birmingham and Boston simultaneously in 2003 and 2005 at academic medical centers. There were 141 patients with clinically negative nodes sentinel lymph node biopsy was done by injecting 1% 5cc methylene blue dye only SLN was isolated in 136 Patients i.e 96.5% and node positive was found in 136 patients i.e 24% [9]. It was found that methylene blue dye alone for isolating SLNs is highly sensitive and an accurate technique [9].

Another study in Egypt in 2004 by using methylene blue it successfully stained SLN in 91.1% cases there were no adverse effects. It was recommended to use this dye safely as is not expensive and easily available in Egypt [10].

Similarly our results are comparable with a study at Queen Mary Hospital London in 2008 using methylene blue dye their identification rate was 97.6%, accuracy over all was 85.7% sensitivity 73% specificity 87.3% with negative predictive value 96.1% [10]. In our study sensitivity was 92% and specificity was 100% with no false positive results.

Methylene blue dye can safely used to detect sentinel lymph nodes as an alternative to isosulphane blue dye [11,12]. Sentinel lymph node is an important tool for staging of axilla and staining of axilla is more accurate in case of sentinel lymph node biopsy which also helps to improve survival further [13,14].

Complications in our study were not significant rather than transient blue discoloration of skin which is comparable to another study conducted in Mashad Iran in 2014 in which local inflammation was noted in only 5 patients out of 312 patients with no skin necrosis. Mild to moderate arm morbidity e.g. painful arm, lymphedema later on was seen in our patients as all these patients underwent axillary clearance as a part of our study protocol otherwise arm morbidity is less in case of sentinel lymph node biopsy alone [15,16].

Conclusion

Sentinel lymph node biopsy using Methylene blue dye is a safe and feasible procedure to identify the sentinel lymph node in patients of breast cancer with impalpable axillary nodes. In our study this technique is proved to be effective in staining the sentinel lymph node by which unnecessary axillary dissection can be avoided in breast cancer surgery

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