Can Accurate Pre Operative Assessment of Axillary Lymph Node in Breast Cancer Avoid Axillary Dissection?

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Abstract

Background: The Axillary Lymph node status is of paramount importance in staging, treatment planning, prognosis and survival in Breast Cancer. Hence appropriate investigating criteria for AXLN assessment, which is easy, noninvasive, repeatable and accurate method is need of the hour. *Materials and Methods:* All the upfront operable breast cancer were considered for the Study. A detail history, thorough clinical examination was done and all the patients were subjected for Axillary Ultrasound and Mammogram. All the patients underwent Axillary dissection of level 1 and 2 clearance along with Mastectomy or Lumpectomy. The Histopathological finding of axillary lymphnode status is compared with clinical, Sonological and mammographic findings. *Results:* In our study of 120 cases,112 cases underwent Modified Radical Mastectomy and 8 cases Lumpectomy with Axillary Dissection. The sensitivity and specificity of AXLN metastases detected by Clinical examination method is 40.16% and 49.83%. The Ultrasound has high sensitivity of 97.59%, indicating that it identifies all the enlarged lymph nodes harboring the metastases, although the specificity is low 81.08% Mammogram showed sensitivity of 60.32% and specificity of 87.72%. Combination of clinical and ultrasound examination showed improved sensitivity as 0.5 cms size lymphnodes could be detected by sonology. *Conclusion:* The clinical staging of axilla in cancer breast is best done using both clinical and Ultrasound examination, as they complement each other and enhance the accuracy.

Keywords: Axillary Lymph Node; Breast Cancer; Axillary Dissection.

Introduction

Breast Cancer is the most common malignancy next only to cancer cervix among Indian women. Axillary Lymph node status is of paramount importance in staging, treatment planning, prognosis and survival in Breast Cancer [1]. In the past Axillary Lymph Node Dissection (ALND) was accepted as a reference standard for the diagnosis of lymph node involvement, but because of side effects such as lymphedema, paresthesia and restriction of shoulder move-ment, sentinel lymph node biopsy (SLNB) has overtaken AXLND [2]. Today management of Axilla by Sentinel Lymph Node Biopsy (SLND) for c N_0 and Axillary Lymph Node Dissection (AXLND) for c N+ are the standard of care [3]. Preoperative accurate evaluation of Axillary lymph node status is thus very important in deciding the further management of Breast cancer. Hence appropriate investigating criteria for AXLN assessment, which is easy, noninvasive, repeatable and accurate method is need of the hour.

There are various investigations for detecting AXLN today. Firstly, clinical examination has always held its prominence. Ultrasound has been shown to be useful tool in the diagnostic armamentarium for nodal staging [4]. Studies have shown mammography also as an important diagnostic tool, but with its own shortcomings [5]. MRI also has been used as a tool for AXLN assessment but has higher cost constraint. Each technique has its own advantages and disadvantages. Hence we felt the need of a study which could determine the effectiveness of these investigating tools.

In our study we have evaluated the effectiveness of preoperative clinical examination, ultrasound

scanning and mammographic evaluation of axilla and compared to histopathological outcome after AXLND at our Institute among breast cancer patients.

Materials and Methods

All the upfront operable Stage I to IIIA, breast cancer patients from January 2016 to December 2017 at Surgery Department, Victoria Hospital were considered for the Study. All patients were explained about the study in detail, and those willing were only included in the study. Written informed consent was obtained from all the participants.

Exclusion Criteria

Metastatic Breast cancers and Unwilling Patients are excluded from the study.

A detail history was taken, emphasis was given for thorough clinical examination and the findings were documented. Examination of Axillary Lymph nodes (Anterior, Posterior, Medial, Lateral and central groups) was done by two clinicians and presence of supra clavicular Lymph nodes was documented. The palpable Lymph nodes of more than 2cms size, hard or matted were taken as positive.
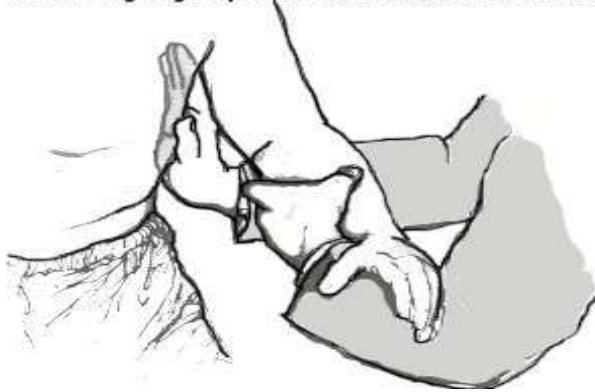

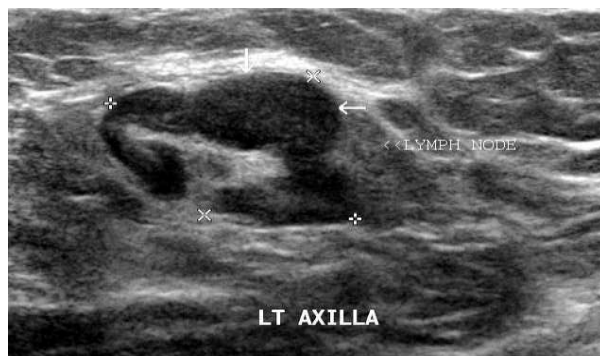**Fig. 1a:** Clinical Axillary Evaluation

Fig. 1b: Ultrasound Axillary Examination

Ultrasound examination of axilla was done by radiologists with 12-15 MHz high frequency linear probe with patient lying in supine position with widely angled arms above the head. Breast and Axilla was studied in transverse and sagittal planes, with special focus on the regions around the Axillary vessels and below the clavicle. The Lymph nodes of more than 2cms size, Solbiati -Index < 2 (longitudinal-transverse diameter ratio), round shape, loss of central echo, disrupted lymph node capsule, increased intra-nodal vascularity or atypical vessels were considered as morphological USG criteria of lymph node metastases [4,5]. Those lymph nodes with Sonological features of metastasis were considered metastatic in our study. Digital mammogram was considered in two views for all proven breast cancer patients and the patients where Medio Lateral Oblique View showed axillary lymph nodes were evaluated. Criteria for considering lymph nodes with metastases on mammogram included size more than 2cms, rounded or irregular shape, speculated margins, absence of fatty hilum or increased density [6].

The histopathological assessment of Axillary dissection specimen was done by pathologist, grossing all the palpable, firm to hard nodular harvested lymph nodes. Total number, gross appearance and cut sections were studied for metastases. Microscopic examination of all significant Lymph nodes after bihalving was done and metastatic lymph nodes were recorded with number and with perinodal spread. The Histopathological status is taken as gold standard for metastases and is compared with other modalities of Axillary Lymph node assessment.
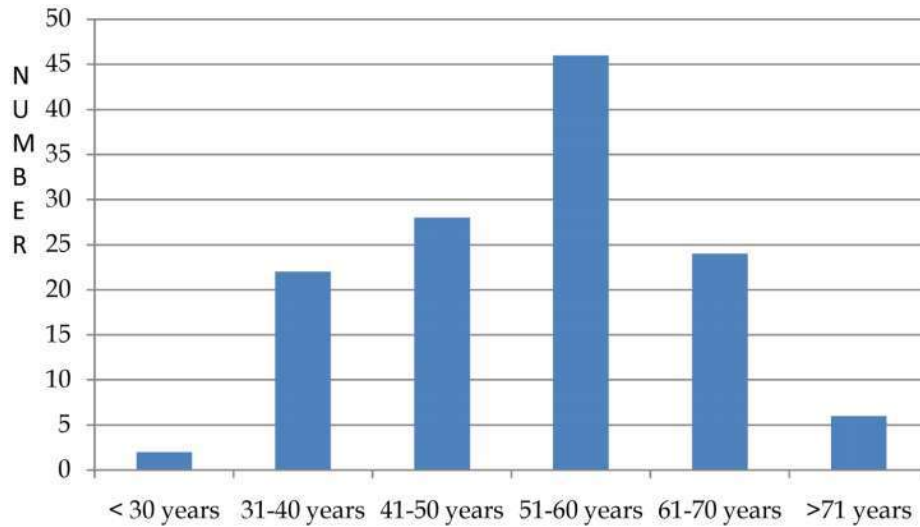
All the data were tabulated and statiscal analysis carried out using SPSS for Windows v 16.0. Descriptive statistics were reported as mean values for continuous variables and as frequency with percentages for categorical variables.

Results

Demographics

1. Age Distribution

In our study 120 cases of breast cancer were analyzed, age group of study population was between 25 -73yrs (mean 48.3 years). We had 56 cases of right breast cancer and 64 cases of left breast cancer. Among 120 patients, 112 underwent Modified Radical Mastectomy and 8 cases underwent wide local excision with Axillary lymph node Dissection (Breast conservation surgery). (Graph 1).

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Graph 1: Bar diagram showing Age distribution of the patients included in the study.

2. Histopathological Types

All the specimens were analyzed at Pathology department of our Institute. Numerous Histopathological types were recorded, of which 90 cases were Invasive Duct cancer, 14 cases were Lobular cancers and 16 were other specific types. (Graph 2).

The clinical examination of axilla detected 31 cases with Positive Nodes. Ultrasound scanning detected about 88 cases with Positive Nodes and Mammogram detected positive nodes in about 45 cases. The pathological examination showed positive nodes in 102 cases.
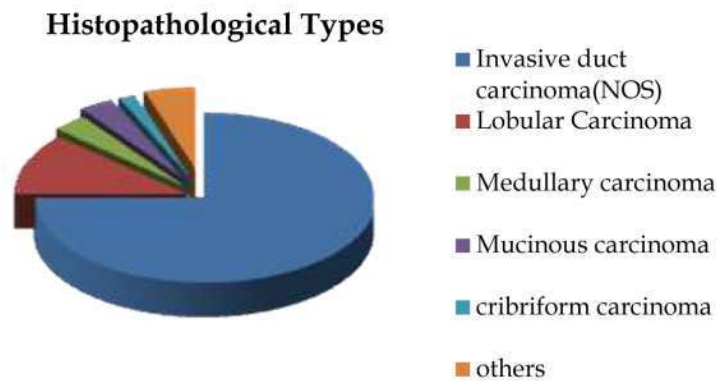
Graph 2: Chart shows share of various histological types of Breast cancer included in the study

Table 1: Statistical analysis and comparison of various methods

Sl. No.	Parameter	Clinical Examination	Ultrasound Examination	Mammogram
1	Sensitivity	40.16%	97.59%	60.32%
2	Specificity	49.83%	81.08%	87.72%
3	PPV	90.16%	92.05%	84.44%
4	NPV	89.83%	93.75%	66.67%

The sensitivity and specificity of AXLN metastases detected by Clinical examination method when cut off of Lymph node size taken was 2cms is 40.16% and 49.83% respectively. The positive and negative

predictive value approximately remains the same of about 90%.

The Ultrasound has high sensitivity of 97.59%, indicating that it identifies all the enlarged lymph

nodes harboring the metastases, although the specificity is low 81.08%. It has highest negative predictive value of 93.75%, inferring that reactive lymph nodes can be identified accurately as non-metastatic.

The sensitivity and specificity of mammogram was 60.32% and 87.72% respectively. This was quiet less compared to other modalities of investigations. Hence it inferred that the sensitivity of mammogram to asses AXLN involvement was quiet low, as all the groups were not seen, though it can tell if the visualized lymph node is involved or not by the metastases. (Table 1).

Discussion

We conducted a prospective study of 120 cases of breast cancers treated from January 2016 to December 2017, at Bangalore Medical College and Research Institute, Bangalore. The Axillary lymph node status was assessed in each case using Clinical Examination, Ultrasound and Mammogram. The results were compared with the gold standard Histopathological examination of the Axillary dissection specimen.

In our study the sensitivity of detecting lymph node by clinical examination is 40.16%. The low Specificity of 49.83% for clinical examination could actually be cause of reactive lymph nodes due to secondary infection of the tumors with skin involvement. But clinically palpable lymph nodes >2cms are considered as positive for metastasis unless proved otherwise. Though Axillary lymph nodes are amenable for FNAC, all palpable nodes are not subjected for FNAC. As micro Mets and small metastases within lymph node will be geographically missed. Hence, Clinical dictum is to consider all palpable significant lymph node as positive for metastasis, but in reality the hard, matted or fixed Lymph nodes are the one with metastases.

Fisher et al study has shown that clinical examination of the axilla is notoriously inaccurate in staging with up to a 30% false positive rate and up to a 45% false negative rate. The studies in the literature have revealed that approximately 35% to 50% of patients with clinically detected invasive cancer prove to be node positive following axillary lymph node dissection (ALND) [7]. Sabahattin aslan et al reported lymph node metastasis in 71.2% of patients which is impressively higher than other studies [8].

The Overall Sensitivity and Specificity of the Ultrasound in detecting Metastatic Lymph nodes

in our study is 97% and 81 %, which is comparable to Fidan et al study showing 91% and 77% respectively [9].

Mammogram showed sensitivity of 60.32% and specificity of 87.72%. Although the Mammogram gives us diagnosis and multicentricity of breast cancer disease, Axillary lymph node assessment is not correct as most of the axilla is pushed out of image [6]. But the specificity of nodal involvement is higher compared to ultrasound study (87% vs 81%).

Supplementing clinical examination with Ultrasound will take us close to the truth of Axillary lymph node status, by characterizing the morphology of enlarged lymph node. The lymph nodes of 0.5cms can be identified and characterized with Ultrasound, as it has high Positive (92%) and Negative predictive (94%) values. Combining Clinical and Ultrasound examination will increase the number of Axillary lymph node positivity, hence Sensitivity. As Ultra sound is easily accessible and expertise is available it can be used as conjunct to clinical examination. In our study combined method showed the Sensitivity of 98.12% and specificity of 90.10%, which is very high compared to individual methods. Kubilay Ertan et al observed palpation alone had a low sensitivity of 31.6% while both modalities combined reached 58%, a statistically sig-nificant increase in diagnostic efficacy ($p= 0.01$) [10].

The limitation of our study being it's Unicentric and Metastatic Breast cancer cases are not included in the study as they may not be undergoing surgery for loco regional control in most of the cases. Also MRI scan, though it is the preferred choice of imaging in young women it is not compared in our study due to high cost and its broad sensitivity (36-78%) and specificity (93-100%) range [12,13,14].

With the advent of less morbid surgery for early breast cancers, like Sentinel lymph node biopsy and no Axillary dissection for N_0 and < 2 Lymph node involvement, pre-operative Axillary Lymph nodal status assessment becomes vital to decide further management [15].

In this background, our study has shown high sensitivity with fair specificity, when clinical examination is combined with the ultrasound examination in the assessment of Axillary Lymph node status among Breast Cancer patients. The clinical staging of axilla in cancer breast is best done using both clinical and Ultrasound findings, as they complement each other and hence the sensitivity and specificity is enhanced.

Further, if preoperative axillary assessment accurately correlates with histological findings ,

can we avoid AXLND in clinically Node negative Breast cancer cases? to avoid complications of axillary dissection. Further randomised study need to be done to know the answer.

Conclusion

The clinical staging of axilla in Cancer Breast is best done by both Clinical and Ultrasound examination, as they complement each other and enhance the accuracy.

Competing Interests

The authors declare that they have no competing interests.

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