



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**

<http://doi.org/10.5281/zenodo.3841326>

Available online at: <http://www.iajps.com>**Research Article**

**IMPORTANCE OF ULTRASONIC GUIDED FINE-NEEDLE  
ASPIRATION CYTOLOGY IN THE ASSESSMENT OF  
AXILLARY NODE STATUS AMONG PATIENTS WITH  
BREAST CANCER**

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**Article Received:** March 2020**Accepted:** April 2020**Published:** May 2020**Abstract:**

**Aim:** The standard axillary treatment for breast cancer patient without clinical evidence of axillary nodes is SLNB and if positive leads to axillary clearance but this has some inherent pitfalls. The main objective of this study was to evaluate the diagnostic accuracy and utility of ultrasound guided FNAC in preoperative assessment of axillary lymph nodes and selecting those who should and should not be offered SLNB in breast cancer patients.

**Place and Duration:** In the Surgical Unit II of Nishter Hospital Multan for one year duration from January 2019 to January 2020.

**Methods:** All prospective or screened breast cancer patients with clinically negative armpit were included in this prospective study. Of the 131 patients, 67 have negative axillary ultrasound scans, while 64 patients with suspicious nodes had FNAC and 27 were positive for malignant tumors.

**Results:** In recent histopathological examination, positive nodes were found in 57 patients: 42/64 (66%) of suspected nodes and Negative axillary ultrasound 15/67 (22%). The U/S has sensitivity of 73% and specificity of 70% while U/S guided FNAC has sensitivity of 64% but specificity of 100%. It correctly diagnosed 27/57(47%) positive nodes and 21% of all patients where axillary clearance was performed directly without SLNB.

**Conclusion:** It is concluded that axillary ultrasound and FNAC are a useful diagnostic tool that will add preoperative information on the status of the axillary node, minimize the false negative factor as well as will save cost and time by avoiding SLNB in nearly a quarter of patients.

**Keywords:** Axillary lymph nodes, Ultrasound guided FNAC, breast cancer, ultrasound examination.

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Please cite this article in press Navaal Anjum *et al*, **Importance Of Ultrasonic Guided Fine-Needle Aspiration Cytology In The Assessment Of Axillary Node Status Among Patients With Breast Cancer.**, Indo Am. J. P. Sci, 2020; 07(05).

## INTRODUCTION:

Breast cancer is the most common cancer in women with significant morbidity and mortality. The axillary lymph node status remains the most important prognostic indicator and best guide for adjuvant chemotherapy, so the investigation of the ideal assessment tool continues. In the past decade, sentinel lymph node (SLN) biopsy has become a standard method for assessing lymph node status<sup>2</sup>. The natural traps of the procedure are the false negative rate of 2.3, which can lead to a false decision about hospital admission, general anesthesia, cost and above all treatment. The reported incidence of 1-15% of patients with negative sentinel node biopsy metastasizes to other affected nodes under the same armpit<sup>4</sup>. Therefore, ask whether another single or complementary procedure will overcome these disadvantages. There are sporadic reports on the use of ultrasound-guided fine needle aspiration cytology for the preoperative evaluation of axillary node metastasis. Therefore, we designed a prospective study to evaluate the effectiveness of ultrasound-guided fine needle aspiration (FNAC) cytology in the preoperative evaluation of axillary nodes.

## PATIENTS AND METHODS:

This study was held in the Surgical Unit II of Nishter Hospital Multan for one year duration from January 2019 to January 2020. All patients who had clinical signs in a clinical trial or were detected by scanning with negative axillary nodes were assessed using high-frequency (7.5-12 MHz) ultrasound probes with colour imaging by single ultrasonologist were included in this study. The arm was abducted to about 90 degrees, after identification of pectoralis muscle's lateral border examination started from level 1 and proceeded towards higher level. Ultrasound examination was considered to be suspected of metastasis if at least one of the following criteria was met: (1) eccentric cortical enlargement ( $>3$  mm) or lobulation with displacement of hilum, (2) absent hilum and irregular border (3) hypoechoic echotexture, (3) spherical node, (4) perinodal vascularity. Where nodes were suspicious of involvement as described above were considered as positive ultrasonographic examination and all these

underwent ultrasound-guided FNAC examination. When the nodes were suspected to be maintained as described above, they were considered to be positive ultrasound and all were FNAC under ultrasound control. Patients with normal nodes on ultrasound were considered negative or normal and no FNAC was performed. Sentinel node biopsy was performed in patients with negative ultrasound or FNAC (C1-C4) nodes, and further treatment was based on SLN biopsy. Meanwhile, patients with a positive (C5) FNAC result went directly to axillary dissection. However, positive patients with FNAC (C5) who applied for preoperative chemotherapy were excluded to reduce the effect of variables such as preoperative neoadjuvant chemotherapy. Similarly, patients without a final histopathological report were excluded from the study. Finally, the results of preoperative ultrasound and FNAC were correlated with the final histopathology of the axillary nodes. Statistical analysis was performed by Epicalc 2000.

## RESULTS:

A total of 191 patients with breast cancer had preoperative axillary and FNAC ultrasound when indicated within a period of 15 months, of which 131 patients with available histopathologic final result and no neoadjuvant therapy were not included. The majority of 74 (56%) patients were from symptomatic patients, and 57 (46%) were cases detected by screening. Although ultrasound was normal in 67 (51%) patients, it was positive in 64 (49%) patients. The average diameter of the positive nodes was 16.5 mm compared to the average diameter of 14.4 mm of negative nodes. The average positive cortical thickness was 4.7 mm, as opposed to 2.2 mm negative nodes. In some cases, apart from minor bruising, no significant complications associated with FNAC or any effect on subsequent underarm procedures were found. Among patients with normal U / S axillary examination, 8 out of 29 patients without visible axillary ultrasound node had positive lymph node metastases, while 38 patients with normal looking ultrasound nodes had 7 nodes. The relationship between positive U / S histopathological examination at the end and final histopathological findings is shown in Table 1.

**Table I: Results of Axillary Ultrasonography and Histopathology**

Axillary U/S Examination	HP +ve	HP -ve	Total
+ve 64	42	22	64
-ve 67	15	52	67
G. Total	57	74	131

\*HP = Histopathology

Patients with suspected or inconclusive axillary ultrasound (65.6%) have a higher incidence of lymph node metastases. Histopathology compared to normal or negative axillary ultrasound (22.3%), regardless of the FNAC result. In addition, 21/39 (54%) of cases

were diagnosed with FNAC before surgery, and 6/18 (33%) of cases detected were diagnosed preoperatively. The FNAC score and its correlation with final histopathology are shown in Table II.

**Table II: U/S Guided FNAC and Histopathology Results**

FNAC	=n	HP +ve	HP -ve	HP not available
C5	37	27(100%)	00	10
C4	04	3(100%)	00	01
C3	03	00	01	02
C2	68	10(14.7%)	19	39
C1	12	2(16.6%)	02	08

Only C5 results were considered positive for metastases, C1-C4 was considered negative and SLN biopsy was performed. A total of 57 patients had positive nodes in final histopathology, of which 27 (47.4%) were correctly diagnosed in FNAC controlled by preoperative U / S.

30 (52.6%) positive nodes were misdiagnosed. Sensitivity, specificity, positive and negative predictive values, sensitivity factor and 95% confidence interval FNAC, as well as axillary ultrasound are shown in Table III, which shows that ultrasound is more sensitive, although less specific, U / S controlled FNAC has low sensitivity, but very high specificity and positive predictive value.

**Table III: Statistical Analysis Results**

Type of Analysis	Ultrasonography Result	95% CI	U/S guided FNAC Result	95% CI
Sensitivity	73%	60.3-84.5%	64%	48-78%
Specificity	70.3%	58.5-80.3%	100%	82-100%
+ve Predictive V	65.3%	52.7-77.1%	100%	84-100%
-ve Predictive V	77.6%	65.8-86.9%	59%	42-75%
Accuracy Rate	71.8%	63.2-79.3%	77%	64-86%

\*CI= Confidence Interval

### DISCUSSION:

Axillary dissection remains the gold standard in assessing lymph node status in patients with breast cancer, but carries high morbidity, costs and a long recovery time. That is why it was largely replaced by sentinel node biopsy. However, SLNB is not a real preoperative assessment tool, among other flaws. Patients who are candidates for neoadjuvant chemotherapy should be properly prepared before surgery. In addition, if SLNB is performed after chemotherapy, the false-negative rate increases from an average of 5% to about 12% of cases. For these reasons, the search for the ideal preoperative tool continues and various imaging methods are being evaluated to detect lymph node metastases such as ultrasound, computed tomography, magnetic resonance imaging, but they are all equally or less accurate. High resolution armpit ultrasound is cheaper,

easier, and less invasive and offers additional benefits for everyone. The precision of preoperative ultrasound diagnostics of lymph node metastases has been increased due to the emergence of high frequency ultrasonic technology and more precise lymph node involvement criteria. Many researchers used ultrasound to assess armpits in imperceptible nodes, and according to morphological criteria, sensitivity is 55.8 to 97.9%, and specificity 48.8 to 75.9%. The sensitivity of this test is 73, its specificity is 70% and accuracy is 71%. In addition, the low sensitivity and specificity of ultrasound is further enhanced by the addition of U / S-controlled FNAC from questionable nodes. Another cause of SLNB failure is neglect. The idea of SN is based on the fact that lymph flows to the first drainage node before going to the rest of the ganglion, so SN is metastasized before the rest. However, in the event of excessive infiltration, the

input is blocked and the lymph is directed to the following nodes. In this neo-sentinel node, tumor accumulation may not occur during assessment, which may give a false negative result. Pre-operative ultrasound and FNAC can detect this neglected damage and help overcome this deficiency, thus minimizing false negative numbers. Other potential benefits; FNAC combined with ultrasound is an outpatient procedure without the need for hospitalization, general anesthesia and takes much less time than the procedure compared to SLNB. Another possible application would be to extend the eligibility criteria for SLNB. Finally, patients diagnosed with FNAC metastasis will go directly to axillary clearance, thus reducing the number of SLN procedures, saving time and costs. In this study, 27/57 (47%) who had lymph node metastases in FNAC got rid of SLNB and had ALND directly. These results can be compared with figures in the range of 30-50%, as observed by Bonnema 1997, Kanter 1999, Boumeester 2003 and Deurloo 2003. However, this small difference in results has many causes, such as patient selection, radiologist and team experience. While Bonnema's increased detection was due to his study of 43% of T2 tumors, our study and Sapino study had over 80% of T1 tumors, and only these two studies included DCIS. At the same time, the 47% detection rate in our study may be the reason why in all these cases we use ultrasound high-frequency color imaging, and the procedure was performed by one dedicated breast radiologist.

### CONCLUSION:

Ultrasound and FNAC are simple, outpatient procedures that are highly reliable in experienced hands and will add additional preoperative information at no additional cost or significant additional equipment. We suggest that ultrasound FNAC should be part of the pre-operative assessment of all breast cancer patients. This will likely help to minimize the number of false negative results and spare a significant number of SLNs, by selecting those patients who need axillary clearance at primary surgery, hence avoiding psychological trauma to patient and financial cost of hospital as well as provide more accurate staging for patients going for neoadjuvant chemotherapy.

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