



Research Article

ROLE OF ULTRASOUND GUIDED FNAC IN AXILLARY STAGING IN BREAST CARCINOMA WITH NO CLINICALLY PALPABLE AXILLARY LYMPH NODES. A PROSPECTIVE STUDY

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ABSTRACT

The purpose of this study was to stage the axilla by USG guided FNAC in clinically node negative cases and whether cumbersome procedure of sentinel lymph node dissection in breast carcinoma can be avoided for staging of axilla. The present study was carried out in Department of Surgery, IGMC, Shimla in collaboration with the departments of Radiodiagnosis and Pathology over a period of 12 months from 1st July 2015 to 30th June 2016 on 40 patients. Patients of diagnosed breast carcinoma and clinically node negative axilla were included in this study. Ultrasound guided FNAC of suspicious axillary lymph nodes was obtained in every case and sent for histopathology and these findings were compared with those of breast surgery specimen. Majority of the patients in the study were above the age of 50 years (75%). Ultrasound guided FNAC of suspicious axillary lymph nodes sensitivity, positive predictive value, and negative predictive value of Axillary USG alone were 85.71%, 80%, and 60% respectively. The overall diagnostic accuracy was 75%. The sensitivity, specificity, positive predictive value and negative predictive value of Axillary USG guided FNAC were 91.66%, 100%, 100%, and 75% respectively. The overall diagnostic accuracy of USG guided FNAC was (93%). We conclude that Ultrasound guided FNAC of non-palpable indeterminate and suspicious axillary lymph nodes is a simple, minimally invasive and reliable technique for the initial determination of axillary lymph node status in breast carcinoma patients and can be immensely valuable in planning the appropriate management of patients, if adopted into routine clinical practice. Patients who have suspicious nodes on ultrasonogram and a subsequently positive FNAC can be considered node-positive and are recommended to undergo Axillary lymph node dissection at the time of primary breast surgery and sentinel lymph node biopsy can be avoided which is much cumbersome and time consuming procedure.

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INTRODUCTION

Breast cancer is the commonest cancer in women worldwide. The developed countries with a small proportion of the world population account for almost 50% of breast cancers. In the developing countries of Asia, the health care burden on account of breast cancer has been steadily mounting¹. Over 100,000 new breast cancer patients are estimated to be diagnosed annually in India. Management of breast cancer is a multidisciplinary approach consisting of surgery, chemotherapy, hormone blocking therapy, monoclonal antibodies and radiotherapy. With increased awareness & screening programs in west, more number of women now present with small tumours, and hence increase in the number of breast conservation surgeries with long term results similar to that of modified radical mastectomy.

Despite the availability of lots of new molecular markers, axillary nodal status still remains the most important prognostic factor for survival in breast cancer. The expected 5 year survival for a node negative breast cancer is over 90% while the survival drops to below 70% in those with positive nodes. Axillary lymph node staging is the single most important prognostic indicator for breast cancer and is fundamental prerequisite in the therapeutic decision. For many decades it has been routine practice to surgically remove axillary lymph nodes for histopathological assessment in all women with invasive disease to determine the most appropriate treatment options. However, only 38% of women with breast cancer have positive nodes².

Current UK guidelines advise that sentinel lymph node biopsy positive women should proceed to completion Axillary Lymph Node Dissection, while node-negative women need no further axillary treatment². While sentinel lymph node biopsy results in considerably less morbidity than Axillary Lymph

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Node Dissection [ALND]³, it does require radioisotope and/or blue dye injection, and usually general anaesthesia. If axillary metastatic disease can be identified prior to surgery, node-positive patients can avoid sentinel lymph node biopsy and have Axillary Lymph Node Dissection as part of their primary surgery. Physical examination alone is very unreliable and has an accuracy of only 30-60% when compared with ALND⁴. Axillary dissection is associated with morbidities including shoulder and arm pain, lymphoedema of arm, seroma and lymphosarcoma. Axillary ultrasound is the primary non-surgical method for evaluating axillary nodes⁵. It is moderately sensitive and can be highly specific, especially when morphologic criteria are used as the primary diagnostic criteria^{6,7}. With the addition of USG-guided fine-needle aspiration or core needle biopsy of suspicious lymph nodes, sensitivity and positive predictive value can be increased^{8,9,10}. The employment of axillary ultrasound and fine needle aspiration cytology of axillary nodes in the preoperative period, allows the surgeon to avoid or perform axillary dissection in node negative or positive patients respectively as a single step surgery. We conducted this study to find out the diagnostic strength of Ultrasound and ultrasound guided FNAC of suspicious axillary lymph nodes preoperatively during the routine work up and to plan our treatment accordingly without compromising oncological principles.

METHODS & MATERIALS

This study was conducted on 40 patients of proven carcinoma breast over a period of 1 year (from July 2015 to June 2016). Patients who were clinically N0 were selected to undergo Axillary Ultrasound. This study was approved by the ethical committee of our institution. Written consent was obtained from the patients included in this study. All patients with cytologically proven Breast Carcinoma with no axillary lymph nodes palpable clinically regardless of age, comorbidity, size of lump, stage of carcinoma were included while patients who underwent Axillary lymph node dissection previously, patients with clinically palpable axillary lymph nodes and patients who refused to be part of the study were excluded from the study. All patients who were found to have suspicious Lymph nodes on Axillary Ultrasound were chosen to undergo Ultrasound Guided FNAC of the suspicious nodes which was done by the same radiologist in every case. The suspicious node on ultrasound was defined according to guidelines of Baruah *et al.*¹¹ The features of a suspicious node taken on ultrasound were: 1. Longitudinal to transverse axis of node ratio of less than 2. 2. Focal eccentric cortical thickening of more than 2 mm. 3. Concentric cortical thickening of more than 3 mm. 4. Compression or obliteration of nodal fatty hilum. 5. Ill-defined nodal margins.

Patient was placed supine and axilla of the side of pathology was examined with a 12MHz ultrasound probe. On detecting any suspicious nodes, USG guided FNAC was taken with a 22G needle attached to a 20cc syringe.

Smears were prepared from the aspirate, air dried and sent for cytological evaluation. All patients were subjected to surgery (MRM/BCS) along with axillary dissection and the histopathological report of the axillary nodes was taken as reference and compared with previous USG guided FNAC report.



USG axilla with LAP, Longitudinal and transverse axis measurement in left, cortical thickness measurement in right.

RESULTS

Out of 40 patients, 30 (75%) had suspicious nodes on axillary USG whereas 10 (25%) were having benign nodes. These 30 patients having suspicious nodes were subjected to FNAC of nodes from the suspicious areas and out of these 30 cases 22 (73.33%) were found to have nodal metastasis on cytological evaluation and 8 (26.67%) were found be negative. On HPE of surgery specimens of 40 patients, 28(70%) were found to be positive for nodal metastasis whereas 12(30%) patients were negative for nodal metastasis. Histopathology of surgery specimen was taken as the gold standard for detection of axillary node metastasis. 24 out of 30 patients having suspicious lymph nodes on USG axilla had nodal metastasis positive on histopathological examination as well whereas the other 6 were negative for nodal metastasis on histopathological examination. 6 out of 10 patients who had benign nodes on ultrasound axilla had negative nodal metastasis whereas 4 had metastasis positive on histopathological examination as depicted in table-1.

Table1 Showing Concordance between USG axilla & HPE

USG axilla	HPE	No. of patients
Positive	Positive	24
Positive	Negative	6
Negative	Positive	4
Negative	Negative	6

All 22 patients who had nodal metastasis positive on USG guided FNAC had nodal metastasis positive on histopathological examination as well whereas 2 out of 8 patients having no metastasis on FNAC had nodal metastasis positive on histopathological examination as shown in table-2.

Table2 Showing Concordance between USG guided FNAC & HPE

USG guided FNAC	HPE	No. of patients
Positive	Positive	22
Positive	Negative	0
Negative	Positive	2
Negative	Negative	6

Using statistical equations following results were observed- The sensitivity, positive predictive value (PPV), and negative predictive value (NPV) of Axillary USG alone were 85.71%, 80%, and 60% respectively. The overall diagnostic accuracy was 75%. The sensitivity, specificity, positive predictive value and negative predictive value (NPV) of Axillary USG

guided FNAC in our study were 91.66%, 100%, 100%, and 75% respectively. The overall diagnostic accuracy of US guided FNAC was 93.33%.

DISCUSSION

In this study we found that the sensitivity, positive predictive value (PPV), and negative predictive value (NPV) of Axillary USG alone were 85.71%, 80%, and 60% respectively. The overall diagnostic accuracy was 75%. Fernandez *et al*⁹ found that when compared with final axillary histology, ultrasound fine-needle aspiration showed positive predictive value of 87%, negative predictive value of 82%, sensitivity of 53% and specificity of 100%. Leenders *et al*¹² reported sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of axillary ultrasound alone as 43.8%, 80.7%, 57.5% and 70.7% respectively. Feng Y, *et al*¹³ reported sensitivity, specificity, PPV, NPV, and accuracy of axillary ultrasound alone as 58.6%, 89.4%, 79.6%, 75.3%, and 76.7%, respectively. A Moore *et al*¹⁴ reported in their study that the overall sensitivity and specificity values for sonography alone were 81% and 69% respectively. Due to overlapping sonographic features of benign/reactive and suspicious/metastatic lymph nodes, a large number of lymph nodes that would otherwise be categorized as indeterminate for metastasis can be more definitively diagnosed if ultrasound is combined with FNAC. We found that the sensitivity, specificity, positive predictive value and negative predictive value (NPV) of Axillary USG guided FNAC in our study were 91.66%, 100%, 100%, and 75% respectively. The overall diagnostic accuracy of USG guided FNAC was 93.33%. Leenders *et al*¹² reported sensitivity, specificity, PPV, NPV of Axillary USG - FNAC as 24.7%, 99.9%, 99.1% and 69.0% respectively. %. Feng Y, *et al*¹³ reported sensitivity, specificity, PPV, NPV, and accuracy of FNAC-USG combine of 52.4%, 100%, 100%, 74.8%, and 80.3%, respectively. Bonnema *et al*¹⁵ who performed US-guided FNA of 122 lymph nodes obtained from 81 axilla and found a sensitivity of 80% and a specificity of 100%. Carroll *et al*¹⁶ in their study evaluated the combined role of axillary ultrasound and fine needle aspiration and concluded that Axillary USG-FNAC had a sensitivity of 63.4% and specificity of 100%. Krishnamurthy *et al*¹⁷ found that USG-FNAC had specificity of 84.6% and sensitivity 84.2%, the diagnostic accuracy was 79%, the PPV was 100%, and the NPV was 67%. Verbanck *et al*¹⁸ reported the sensitivity of USG-FNAC in detecting malignant nodes was 92%, the specificity 95%, and the PPV and NPV 96% and 91%, respectively. Holwitt DM, *et al*¹⁹ reported sensitivity and specificity of USG-FNAC as 71% and 99%, with a NPV of 84% and PPV of 97%.

We had 2/30 (6.66%) false negative results. Bonnema *et al*¹⁵ reported a false negative result of 12%. Krishnamurthy *et al* reported¹⁷ 12/103 (11.6%) as false negative cases. Holwitt *et al*¹⁹ reported false negative rate of 8% (9 out of 110 patients). False-negative FNAC results probably occurred in part due to failure to target the real SLN or the most suspected region of the lymph node and perhaps misinterpretations including failure to recognize tumour cells.

CONCLUSION

Ultrasound guided FNAC of non-palpable indeterminate and suspicious axillary lymph nodes is a simple, minimally invasive and reliable technique for the initial determination of

axillary lymph node status in breast carcinoma patients. The high sensitivity, specificity and PPV and relatively low false-negative rate of USG- guided FNA of non-palpable axillary lymph nodes indicate that it is a useful procedure in the initial staging of breast carcinoma and can be immensely valuable in planning the appropriate management of patients if adopted into routine clinical practice. Patients who have suspicious nodes on ultrasonogram and a subsequently positive FNAC can be considered node-positive and are recommended to undergo Axillary Lymph Node Dissection at the time of primary breast surgery itself. In this group of patients sentinel lymph node biopsy can be avoided which is much cumbersome and time consuming procedure. However a study with a much larger population may help to further substantiate the findings observed in the present study.

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