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Evaluation of efficacy of USG and USG guided FNAC of axillary lymph node of carcinoma breast in clinically node negative cases

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Abstract
Background: Breast carcinoma is the most common cancer in the women of developed countries. In India, it accounts for 25-30% of all cancer in women. The average age of developing cancer is shifted from 50-70 years to 30 to 50 years. In the absence of distant metastasis, assessment of axillary lymph nodes is the most important component of initial staging process and the presence or absence of axillary metastasis is the strongest prognostic factor for carcinoma breast due to its impact on the subsequent management. Cancer in the young is found to be more aggressive as compared to older age group.
Objectives: To find out the efficacy of ultrasound and ultrasound guided FNAC of axillary lymph node of carcinoma breast and evaluation of axillary metastasis in clinically node negative cases.
Methods: This was a comparative study done at a rural tertiary care centre from November 2018 to November 2020. All the patients with clinically node negative carcinoma breasts were evaluated with USG Axilla and those found to be having lymph nodes were subjected to USG guided FNAC and these were correlated with the Histopathology report.
Results: 24 patients who satisfied the inclusion criteria were included in study. The most common age group involved in this study was 35-45 years. The most common location of the lump was found to be upper outer quadrant. The sensitivity of the USG in detecting axillary lymph node was 50%, specificity 75%, positive predictor value 80%, negative predictor value 42.8% and accuracy of 58.3%. Sensitivity of USG guided FNAC was 50%, specificity 100%, positive predictor value 100%, negative predictor value 50% and accuracy of 66.6%.
Conclusion: This study concluded that USG-FNAC of axillary lymph node is a simple, minimally invasive and reliable diagnostic approach for the initial staging of axillary lymph node status in patients with carcinoma breast. The PPV of 100% and NPV of 50% indicate that the predictor power of a positive result is excellent but nevertheless a negative result is less helpful. High sensitivity and specificity and relatively low false negative rate of USG and guided FNAC of non-palpable axillary lymph nodes indicates that it is immensely valuable in planning the appropriate management of patients.

Keywords: axillary lymph node, breast carcinoma, USG guided FNAC

Introduction

A lump in the breast whether inflammatory, benign or malignant, is one of the most prevalent reasons for a woman to seek consultation with surgeon. Benign breast lesions are common and though not life threatening, but may be the cause of much concern till the possibility of a malignant process is excluded. Carcinoma of the breast is the second most common cancer among females in India. Significant numbers of malignant lesions are considered benign by clinical examination and mammography [1]. This appears to be a particular problem in patient below 50 yrs. of age where 40% of carcinomas are considered benign or normal by clinical examination [2]. Thus, clinical diagnosis calls for further investigation for confirmation of diagnosis. To overcome this difficulty, many more accurate and sophisticated diagnostic modalities like mammography, ultrasonography, have been advocated and evaluated to arrive at an accurate preoperative diagnosis. Each modality of investigation has certain advantages like sensitivity, specificity, etc. in adding to the diagnosis of different breast pathologies with the evaluation of advanced investigation modalities, breast cancers are now detected in early stage and the patients are undergoing less radical surgery like breast conservation surgery [3]. Axillary lymph node is one of important predictor of prognosis in patients with breast cancer. It can be assessed with various methods, but histopathological study is most accurate. But non-invasive study like USG and USG guided FNAC of axillary lymph node preoperatively, in clinically node-negative axilla, can help to avoid more invasive method like sentinel lymph node biopsy which has its own complication like pain, lymphedema, shoulder joint stiffness [4]. Preoperative axillary staging in breast cancer is saving time and resource [5]. Moreover facility for sentinel lymph node biopsy, gamma probe and gamma camera not available at all centres. Given the limitation of sentinel lymph node biopsy, it was decided to evaluate the efficacy of USG and USG guided FNAC in differentiating metastatic and non-metastatic axillary lymph nodes in clinically node-negative breast cancer [6].

Objectives

To find out the efficacy of ultrasound and ultrasound guided FNAC of axillary lymph node of carcinoma breast and evaluation of axillary metastasis in clinically node negative cases.

Materials and Methods

Source of Data: 24 clinically and FNAC proved carcinoma breast in KVG Medical college and hospital, Sullia, DK, Karnataka.

Inclusion Criteria

1. All the cases of proven carcinoma breast of all the age group and both sexes.
2. Clinically node negative cases

Exclusion Criteria

1. Previously operated and previously taken treatment.
2. Those with node negative but having evidence of systemic metastasis.
3. Clinically node positive cases

Method of Collection of Data

All cases satisfying the inclusion criteria was chosen for the study.

Informed consent was obtained from them, then they were subjected to ultrasonography and ultrasonography guided FNAC of the axillary lymph nodes and a report was obtained from the pathologist regarding the status of the axillary nodes, which was compared with the histopathology report obtained of the post - Operative specimen, regarding the status of the nodes after axillary dissection and the accuracy of USG and USG guided FNAC was assessed by appropriate statistical methods.

Ethical clearance has been taken from the ethical committee

Results

52 patients were seen during study period from November 2018 to November 2020, out of which 24 patients were clinically negative for axilla. So 20 % of cases are found to be clinically negative for axillary lymph node. This was a comparative study conducted at KVG Medical College and Hospital, Sullia, DK.

All the patients with clinically node negative carcinoma breast were evaluated with USG axilla and those found to be having lymph nodes were subjected for USG guided FNAC and these were correlated with the histopathology report. A total of 24 patients were included in this study. Data was analysed and appropriate statistical methods used to present the data.

Table 1: Age Distribution of Patients In The Study

Sl No.		No. of pts	Percentage
1	20-30	2	8.3%
2	30-40	10	41.6%
3	40-50	2	8.3%
4	50-60	6	25%
5	60-70	4	16.6%

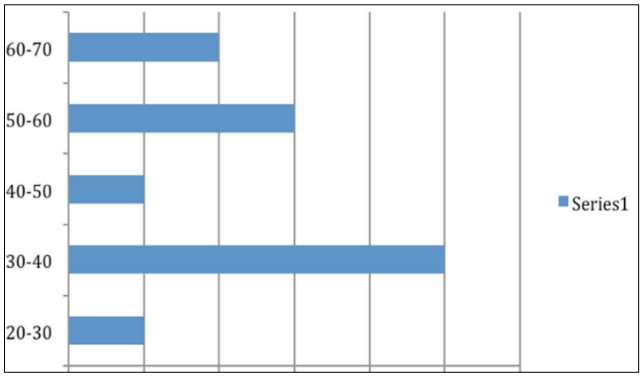

Fig 1: Shows bar chart representing age distribution in our study most are in 30-40 age group

Table 2: Lump Location

Sl No.	Quadrants	No. of pts	Percentage
1	RUIQ	0	0
2	RUOQ	8	33.33%
3	LUIQ	8	33.33%
4	LUOQ	8	33.33%

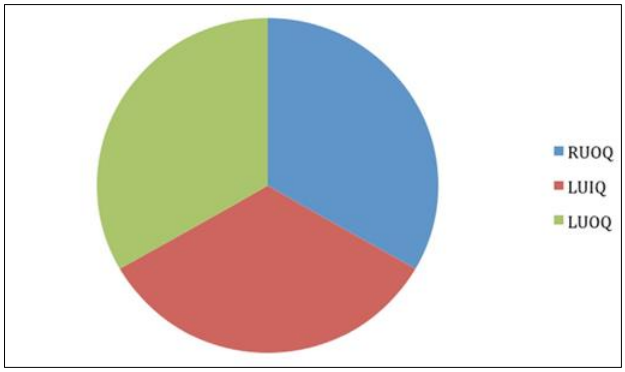

Fig 2: is the pie chart showing location of lump in breast and we can see that upper outer quadrant is most commonly involved

Table 3: USG OF AXILLA

Sl No.	Lymph nodes detected	No. of pts	Percentage
1	LN +	10	41.7%
2	LN -	14	58.3%

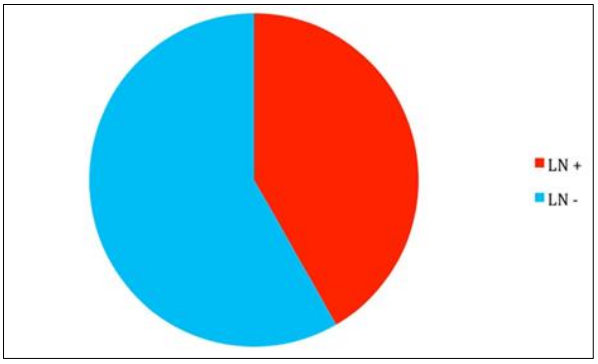

Fig 3: pie chart depicts the lymph nodes detected by ultra sound

Table 4: USG Guided FNAC Of Axillary Lymph Node

Sl No.	Metastatic deposit of LN	No. of pts	Percentage
1	positive	8	80%
2	negative	2	20%

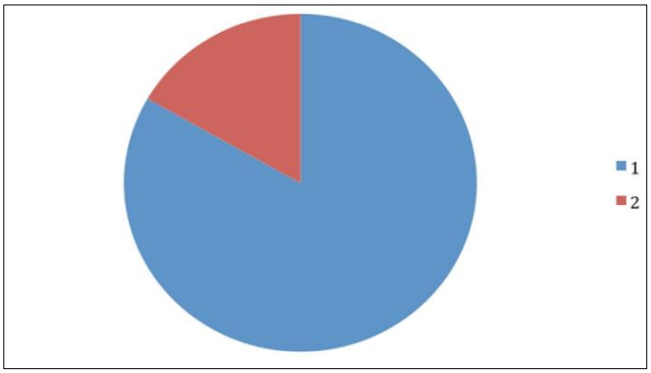

Fig 4: is the pie chart depicts USG guided FNAC of axillary lymph node

Table 5: Lymph Nodes Positive For Tumor Deposits In Histopathology Specimen

Sl No.	Lymph node tumor deposit	No. of pts	Percentage
1	positive	16	66.7%
2	negative	8	33.3%

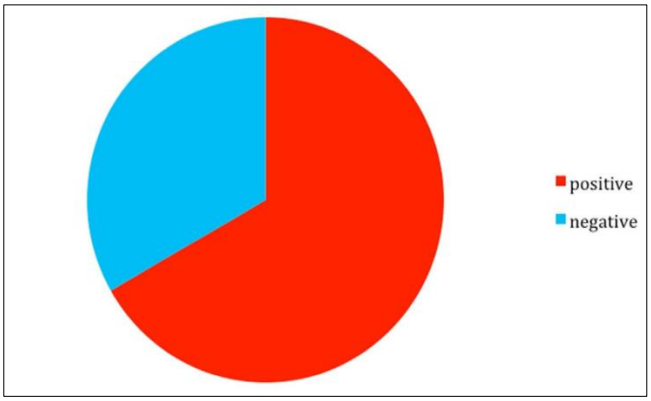

Fig 5: is the pie chart depicting the lymph nodes positive for tumor deposits in histopathology report.

Table 6: T Status of Patients Without Clinically Palpable Lymph Node

Sl No.	T status	No. of patients	%
1	T2	8	33.4%
2	T3	10	41.6%
3	T4	4	16.6%
4	Tx	2	8.4%

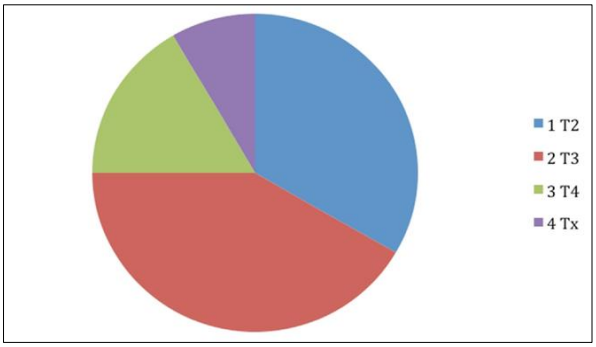

Fig 6: pie chart depicting T status of clinically node negative patients

Table 7: T Status of USG Positive Cases

Sl No.	T status	No. of patients	%
1	T2	6	75%
2	T3	4	40%

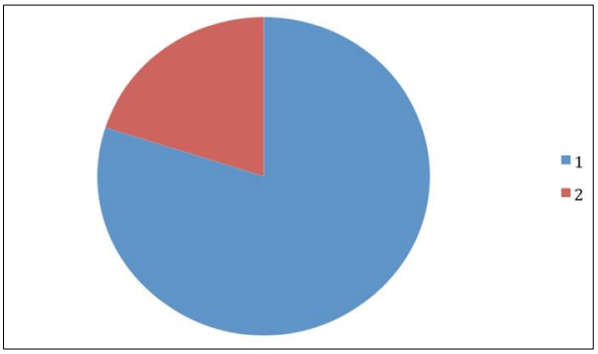

Fig 7: Pie chart depicting T status of USG positive cases

Table 8: T Status of USG Positive and FNAC Positive

Sl No.	T status	No. of cases	%
1	T2	4	50%
2	T3	4	40%

Table 9: T Status of USG Positive and FNAC Negative Cases

Sl No.	T status	No. of patients	%
1	T2	2	20%

Table 10: Correlation Between Lymph Nodes Detected In USG And With HPR

A (true Positive) =8	B (false positive) =2
C (false Negative) =8	D (true negative) =6

Sensitivity of USG =a/a+cx100=50%
Specificity of USG=d/b+dx100=75%
Positive predictive value=a/a+bx100=80%
Negative predictive value=d/c+dx100=42.8%
Accuracy=a+d/a+b+c+dx100=58.3%

Table 11: Correlation Between USG Guided FNAC and HPR

A (true positive) =4	B (false positive) =0
C (false negative) =4	D (true negative) =4

Sensitivity =a/a+cx100=50%
Specificity=d/b+dx100=100%
Positive predictive value=d/a+bx100=100%
Negative predictive value=d/c+dx100=50%
Accuracy=a+b/a+b+c+dx100=66.6%

Discussion

Breast cancer remains the most common malignancy among women and accounts for 32% of all cancers in women. The average age of developing cancer is shifted from 50-70 years to 30-50 years, cancer in young tend to be more aggressive. In the absence of distant metastasis, Assessment of axillary status is the most important part of initial staging process because of its subsequent importance in management. And the absence or presence of axillary metastasis is the strongest prognostic indicator available for breast carcinoma [7, 8].

Axillary lymph node dissection is a useful staging procedure for patients with primary breast cancer. Physical examination alone is neither sensitive nor reliable way to ascertain lymph node status, because metastatic lymph nodes are often not palpable and reactive lymph nodes may be mistaken for metastasis [7, 8]. Axillary lymph node dissection is found to be positive in 30% of palpable tumors and 10% of non-palpable tumours in patients with clinically negative axillary involvement. The remaining 70-90% undergo unnecessary axillary dissection [9, 10].

Today because of wide spread use of mammography as screening tool has led to detection of lesion in early stage [11, 12]. The rate of lymph node involvement in early stage is very low. So, in order to avoid unnecessary ALND and the morbidity associated with it different techniques have been used for detection of axillary metastasis preoperatively. The SLNB has been introduced for that only. But this technique is time consuming and may require immunohistochemistry study, technical expertise and also required a team of nuclear medicine specialist, surgeon and pathologist. Moreover, facilities for it are not available in all centres and is also not cost effective. Among the imaging modalities ultrasound has been investigated for its non-invasive nature and the ease for it in evaluating the axilla. It visualises not only alteration in size, shape contours of lymph nodes, but also changes in cortical morphology and texture that can reflect the presence of axillary metastasis. The sensitivity of USG is further increased if combined with USG guided FNAC of any sonographically detected suspicious lymph node [13-15]. Ultrasound-guided fine-needle aspiration cytology has a higher NPV (55.56%) than USG alone (50%). This means that probability of a patient with negative USG-FNAC not having axillary node metastasis is higher than that with negative US alone. It also signifies that USG-FNAC can detect negative ALN preoperatively but only with a predictive valve of 55.56% [16].

In a study conducted by Dana et al which was done in 256 clinically node negative patients showed the sensitivity and specificity of AUS alone were 79% and 81%, respectively. The sensitivity and specificity of FNAB/needle core biopsy alone were 89% and 93%, respectively. The overall combined sensitivity and specificity for AUS-guided FNAB/needle core biopsy were 71% and 99%, respectively, with a NPV of 84% and PPV of 97% [17]. In a study conducted by Tahir M et al which was done in 197 patients with clinically node negative patients showed the sensitivity of ultrasound guided fine needle aspiration biopsy was 47.1%, specificity 100%, positive predictive value 100%, negative predictive value 70%, with overall accuracy of the procedure 76.3% [18]. In a study conducted by Jung J et al showed the sensitivity, specificity and positive and negative predictive values of the ultrasound alone were 67, 84, 75 and 78%, retrospectively. The sensitivity, specificity and positive and negative predictive values of the US-FNAC were 84, 97, 97 and 85%, respectively [19]. The study conducted by de Kanter AY et al concluded that in patients without palpable lymph nodes sentinel lymph node biopsy could be avoided in 17% since USG and USG guided FNAC has already diagnosed axillary metastasis. Axillary lymph node echo guided fine needle aspiration cytology enables breast cancer patients to avoid a sentinel lymph node biopsy [20]. In a study conducted by Sumita et al showed USG of axilla in correlation with USG Guided FNA showed the sensitivity, specificity, positive predictive value and negative predictive value of 92.2%, 87.8%, 94.6% and 82.7% respectively. The overall sensitivity and specificity of USG alone was 67.9% and 91%, but by adding USG Guided FNA, the sensitivity increased to 92.2% and specificity to 87.8%. USG alone showed the accuracy of 86.5% which was improved to 90.9% by adding USG guided FNAC [21].

Table 12: Comparison of sensitivity and specificity of USG-FNAC in different studies.

Authors	Sensitivity (%)	Specificity (%)
Tahir et al[18]	47.1	100
Popli et al[16]	78.9	100
Present study	50	100

In present study, of the 24 cases of breast cancer, US correctly identified 63.33% cases with ALN metastasis (sensitivity). It also correctly identified 100% cases without ALN metastasis (specificity). The probability of a patient with positive nodes on USG having ALN metastasis on ALND was 100% (PPV). The probability of a patient with negative nodes on US not having metastasis on ALND was 55% (NPV). The overall diagnostic accuracy was 75%. It is generally well recognized that the rate of detection of suspicious lymph nodes increases significantly as the number of lymph nodes seen on US examination of the axilla increased. Because of overlapping sonographic features of benign/reactive/suspicious/metastatic lymph nodes, USG was combined with FNAC for more accurate results. The sensitivity of USG-FNAC was 50%, whereas specificity was 100%. The positive predictive value is 100%, negative predictive value is 50% and accuracy of 66.6%.

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