

A study of diagnostic accuracy of ultrasonography in breast disease

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Abstract

Introduction: Breast cancer is one of the commonest cancers in females and causes extensive morbidity and mortality. The incidence of carcinoma breast is high in USA, North America and Northern Europe and is low in most Asian and African Countries. Breast health awareness has resulted in increasing detection of early breast cancer and corresponding decrease in breast cancer morbidity. About 80% of breast biopsies result in benign pathology. Symptomatic breast lesions are traditionally evaluated by clinical, radiologic and cytological methods. **Aims and Objectives:** To evaluate the diagnostic accuracy and value of ultrasonography in as assessment of breast disease **Methodology:** All the cases underwent a thorough clinical examination followed by anultrasonography of both breasts and fine needle aspiration cytology(FNAC).If surgery was indicated, Histopathology of the specimen was done and there port compared with the ultrasonography reports **SOURCE OF DATA:** This study was a prospective study from October 2011 to October 2013 done at YMCH, Deralakatte and Mangalore. **Result:** Most common way of presentation of the tumor was Lump i.e. 90% and Pain 10%. Most common diagnosis by USG were Ca-breast, Fibroadenosis, Indeterminate. Most common diagnosis by Histopathology were Infiltrating lobar carcinoma, infiltrating ductal carcinoma with Neuroendocrine differentiation, Fibroadenoma. The sensitivity of the test (USG) is 90%, the specificity of the Test is also 90% and Positive predictive value is 85.71%. **Conclusion:** However from this study it can be concluded that ultrasonography can be highly accurate in differentiating benign from malignant disease. Ultrasound may even avoid unnecessary FNAC's which in turn reduces the pain and the cost burden to the patient.

Keywords: Diagnostic Accuracy of Ultrasonography, Breast diseases.

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INTRODUCTION

Breast cancer is one of the commonest cancers in females and causes extensive morbidity and mortality. The incidence of carcinoma breast is high in USA¹, North America and Northern Europe and is low in most Asian^{2,3,4,5} and African Countries. Breast health awareness has resulted in increasing detection of early breast cancer and corresponding decrease in breast cancer morbidity. About 80% of breast biopsies result in benign pathology. Symptomatic breast lesions are traditionally

evaluated by clinical, radiologic and cytologic methods. Approximately 95% of symptomatic breast lesions will be diagnosed using Triple Assessment. The role of FNAC and USG in the diagnosis and management of breast disease is increasing. The sensitivity of FNAC in the diagnosis of breast cancer in general is 72-99% but this is lesser in case of invasive lobular carcinoma, smaller cancers and ductal carcinoma in situ⁸. The specificity is 98 – 100%⁶. Each of these diagnostic modalities by itself has an appreciable false negative rate. The inaccuracy in the diagnosis of breast disease can be overcome by combination of these diagnostic methods by which sensitivity increases. Wild and Neal in 1952 were the first to report the use of diagnostic sonography in the evaluation of breast disease⁷

AIMS AND OBJECTIVES

To evaluate the diagnostic accuracy and value of ultrasonography in assessment of breast disease.

METHODOLOGY

All the cases underwent a thorough clinical examination followed by an ultrasonography of both breasts and fine needle aspiration cytology (FNAC). If surgery was indicated, Histopathology of the specimen was done and there port compared with the ultrasonography reports

SOURCE OF DATA: This study was a prospective study from October 2011 to October 2013 done at YMCH, Deralakatte, Mangalore It comprises of 50 cases of breast lumps which presented at the out-patient department at YMCH. **Method Of Collection Of Data:** All the cases underwent a thorough clinical examination followed by an ultrasonography of both breasts and fine needle aspiration cytology (FNAC). If surgery was indicated, Histopathology of the specimen was done and the report compared with the ultrasonography reports

Inclusion Criteria: All patients above the age of 20 years presenting with lump in the breast, breast pain or pathological discharge from the nipple.

RESULT

Table 1: Distribution of Patients as per Mode of Presentation

Mode of Presentation	C/C	Percentage
Lump	45	90%
Pain	5	10%

Most common way of presentation of the tumor was Lump i.e. 90% and Pain 10%

Table 2: Distribution of the Patients as per USG Diagnosis

Benign Breast Disease	2	4%
Breast abscess	3	6%
Ca-breast	20	40%
Chronic Inflammatory mass lesions	1	2%
Fibroadenosis	9	18%
Galactocoele	3	6%
Gynacomastia	2	4%
Indeterminate	6	12%
Infected galactocole	1	2%
Normal	1	2%
Phylloid tumor	1	2%

Most common diagnosis by USG were Ca-breast, Fibroadenosis, Indeterminate.

Table 3: Distribution of the Patients as per Biopsy (Fnac+Trucut+Open Biopsy)

Infiltrating ductal carcinoma	6	12%
Benign phylloid tumor	1	2%
Benign adenosis	1	2%
Fibroadenoma	6	12%
Fibroadenomatoidhyperplasis	1	2%
Fibroadenosis	2	4%
Galactocoele	1	2%
Granulomatous mastitis	1	2%

Gynacomastia	1	2%
Infiltrating ductal carcinoma	6	12%
Infiltrating ductal carcinoma with Neuroendocrinedifferentiation	12	24%
Infiltrating lobular carcinoma	1	2%
Infiltrating lobar carcinoma	1	25%
Malignant phylloid tumor	7	14%
Medullary cancer of breast	1	2%

Most common diagnosis by Histopathology were Infiltrating lobar carcinoma, Infiltrating ductal carcinoma with Neuroendocrine differentiation, Fibroadenoma.

Table 3: Distribution of Lesion based on USG versus Biopsy

USG	Based on Biopsy		Total
	Malignant	Benign	
Malignant	18	3	21
Benign	2	27	29
Total	20	30	50

From Table 3: The sensitivity of the test (USG) is 90%, the specificity of the Test is also 90% and Positive predictive value is 85.71%.

DISCUSSION

Breast diseases range from mild changes in the tissue to full-fledged malignant change. These cause considerable physical and psychological morbidity. A palpable mass in awoman's breast represents potentially a serious lesion and requires prompt evaluation. The sensitivity of the ultrasound is 90 % and specificity is 90% according to the present study. The specificity according to the present study is the higher than that of any of the other studies Shahid *Et al* 95.24% 98.30% Whitehouse Pa *Et al* 76% 68.75%. Carcinoma of the breast was histologically found in 20 cases out of which 18 were correctly diagnosed by ultrasound, thus a sensitivity of 90%. This diagnostic accuracy was better as compared to Kopans *et al* ⁸ (52.6%), Mansoor *et al* (57.14%) ⁹. In the study by Durfee *et al*¹⁰ 97% of cancers were hypoechoic. Benign lesions of the breast were more readily diagnosed by ultrasound than malignant lesions. Sensitivity of the ultrasound in diagnosis of fibroadenoma of the breast was 81.6%. This is consistent with the findings of Fleishcher *et al* ¹¹(89%), Hyashi *et al* ¹² (93%) and Mansoor *Et al*⁹ (81.8%). The accuracy of ultrasound in diagnosing cystic breast lesions was 92%, which is in accordance with findings of Fleishcher *et al* ¹¹(96%) and Mansoor *et al* ⁹(90.9%). The Ultrasound features most predictive of a benign diagnosis were oval or round shape (95% were benign), circumscribed margins (86% were benign) and width AP ratio > 1.4 (87% were benign). This was similar to the results of Rahbar *et al*¹³ where in these features were present in 94%, 91% and 89% respectively. The features most predictive of amalignant diagnosis were

irregular shape (53% were malignant), Non-circumscribed margins (41% were malignant) and width AP ratio = 1.4 (39% were malignant). These results were again in conformity to the results obtained by Guita Rahbar *et al*¹³, where in these features were present in 61%, 50% and 40% respectively. In another study a sensitivity value of 95%, specificity of 94.10%, positive and negative predictive values of 95.50% and 93.75% were noted¹⁴. Similarly another study suggested that Ultrasound use should be considered in most instances of a palpable breast finding, particularly in young women. A primary advantage is the ability to directly correlate the physical exam finding with imaging. Ultrasound is useful in characterizing palpable masses as well as detecting cancer in women with negative mammograms. The negative-predictive value of imaging for cancer in the evaluation of a palpable lump is very high, which may reassure women with low-suspicion palpable findings¹⁵. Most recent study also suggests that the negative predictive value of sonography for palpable breast masses with probably benign morphology was very high (99.4%)¹⁶.

CONCLUSION

The management of breast disease relies heavily on breast imaging and tissue diagnosis either in the form of FNAC or biopsy. We have studied 50 cases of breast diseases and subjected them to clinical examination, ultrasound of the breast and FNAC/Biopsy. It is evident that the accuracy of the diagnosis increases when all three modes are employed. Ultrasonography is dependent on the operator skills. However from this study it can be concluded that ultrasonography can be highly accurate in differentiating benign from malignant disease. Ultrasound may even avoid unnecessary FNAC's which in turn reduces the pain and the cost burden to the patient.

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