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Spectrum of imaging findings in clinically palpable female breast lumps in a tertiary care centre in NE India

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ABSTRACT
BACKGROUND*-Females with clinically palpable breast lumps frequently present to imaging departments. Imaging is crucial for determining the patient's diagnosis and deciding whether or not they should have additional investigations.However, there is still a lot of confusion regarding the best imaging modality used and how frequently imaging is needed. The radiologist can guide proper management of the patients by understanding their clinical, pathologic, and imaging characteristics. The goal of this article is to evaluate & describe various imaging findings in female patients coming with clinically palpable breast lumps.*
METHODOLOGY*- This was a prospective study, a total number of 33 cases referred to the department of Radio-diagnosis, Tezpur medical college & hospital were evaluated using USG & MRI. All cases were histologically verified; their findings were reviewed and compared to radiological findings.*
CONCLUSIONS*- In young women, the majority of breast lesions are benign. Ultrasonography is a critical first imaging modality in the diagnosis of breast lesions.*
KEYWORDS*: Breast lesions, female, MRI, US.*

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I. INTRODUCTION

A palpable breast lump is a common presenting symptom in women, whether self-detected or discovered through a professional breast examination.[1] Despite the fact that the majority of lumps are benign, a palpable lump can generate understandable worry in the patient, leading to additional clinical and imaging evaluations, biopsy, and surgery. [2]Breast lesions in young women differ significantly from those in adults, with the former being mostly benign.[3] Benign breast lesions may range from fibrocystic discases, simple cysts, galactocele, fibroadenoma, lactating adenoma etc. [4]Granulomatous mastitis, mostly tubercular in origin is also a not so uncommon finding in this part of the country. Malignant lesions include ductal carcinoma in-situ to infiltrating ductal & lobular carcinoma. [5]Understanding the differential diagnosis of breast lesions in a female can aid in determining the best course of action. Given that the most prevalent symptom associated with breast cancer is a palpable breast lump, proper diagnostic workup is mandatory. [6] The majority of women who have a clinically suspicious palpable bump should have it scanned. Ultrasonography is the primary investigation modality due to its wider availability, low cost and lack of ionising radiation.[7,8] Mammography is done in females above 35 years of age & is useful for detecting microcalcifications and suspicious masses in the breast.[9] Patients with deeper breast masses or chest wall lesions and those remaining undetermined on initial investigations usually benefit from MR imaging.[10]Intervention methods pose a substantially higher danger to the developing breast than to the mature breast. As a result, in young girls, the conservative approach of clinical and ultrasonographic follow-up is more typical.[1112] Concerted action of the radiologist along with the patient and the referring physician is crucial in ensuring that women with palpable breast abnormalities are properly evaluated and cared for.[13]

METHODOLOGY

This was a prospective study, a total number of 33 cases with breast lumps referred to the department of Radio-diagnosis, Tezpur medical college & hospital were evaluated using USG & MRI. All cases were histologically verified; their findings were reviewed and compared to radiological findings.

USG ASSESSMENT

The ultrasound was performed with a 7.5 MHz linear array transducer on a SAMSUNG RS80A ultrasonic instrument. Gray-scale and doppler images were captured in real time. The patients were in a supine position, with the ipsilateral upper limb stretched cephalad and a pillow under the ipsilateral shoulder, and turned slightly to the contralateral side. In longitudinal, transverse, and radial planes, the perceptible mass was scanned.The location of the mass was indicated by the clockface. Borders, echogenicity, posterior echoes, and depth-width ratio were all used to evaluate the masses.Each mass was assigned to one of two categories: benign or malignant. The American College of Radiology (ACR) BIRADS system was used to classify the breast lesions in our investigation.

MRI ASSESSMENT

MR imaging was performed on a 1.5-T MR imaging unit (Philips ingenia). All the patients were imaged in the prone position using 7 channeled breast coil.DCE-MRI (dynamic e-THRIVE sequences) and DWI with ADC mappings were added in conjunction with conventional MRI (T1, T2, STIR sequences. Contrast was given intravenously according to the patient's weight using a power injector at a rate of 3 mL per second, flushed with 10 cc of saline. Dynamic T1-weighted fat-saturated sequences are taken in both pre & post contrast (60, 120, 180, 240, 360 sec after contrast administration)phases on both sides. In this study, we have categorized the breast masses using the BIRADS lexicon of the American College of Radiology (ACR). The signal intensity characteristic, margins, enhancement patterns have been described. The three types of kinetic curves -- Type I, continually enhancing (progressive) patterns, which are indicated of benignity; type II, plateau type, which has an intermediate risk of malignancy; and type III, washout type, which is suggestive of malignancy are assigned to each of the lesions.

II. RESULTS-

A total of 33 of clinically palpable breast lesions were examined at the radiology department from march, 2021 to march, 2022. The cases were stratified by age into those below 25 years, 6 cases (10 %); between 25 and 45 years, 13 cases (43.3%); 45 to 65 years 8 cases (26.7%) and those above 65 years, 6 cases (20%). The lesions were primarily classified into benign, and malignant lesions. There were 21 cases (63.6 %) benign, 12 cases (36.4 %) malignant.

Table 1- basic types of lesions & their percentage

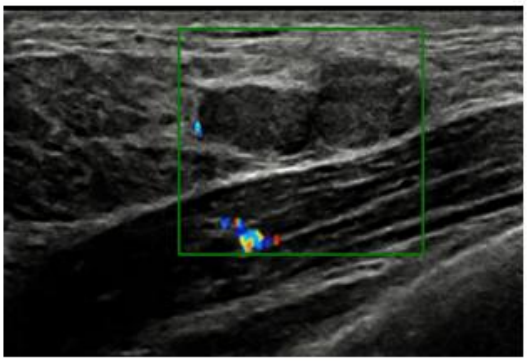
Cases	**N0.**	**%**
Benign	21	63.6
Malignant	12	36.4

Table 2- age distribution

AGE	**Total -33**	
	No.	%
Less than 25	6	18
25-45	13	39.3
45-65	8	24.2
More than 65	6	18.2

Table 3- different lesions & their percentage

	NO.	%
Cyst	4	12.1
Fibroadenoma	7	21.2
Galactocele	1	3.0
Lactating adenoma	2	6.0
Infective/inflammatory	3	9.1
Phyllodes	4	12.1
Papillary ca	1	3.0
Ductal/lobular ca	11	33.3



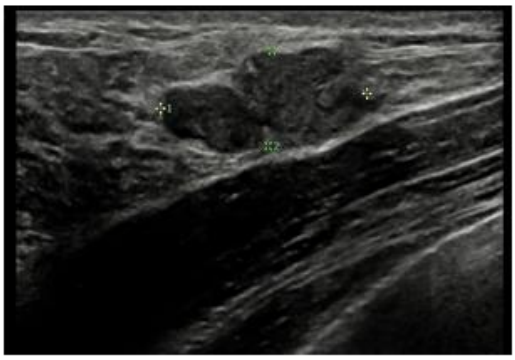


Fig-1 A 25year female patient presented with painless swelling in the left breast for 6months. USG revealed a well-defined, lobulated lesion having wider than taller orientation indenting the underlying pectoralis major muscle. It was given as fibroadenoma, later confirmed on FNAC.

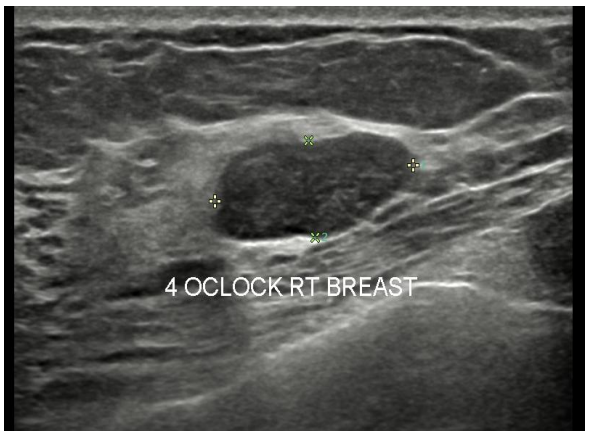


Fig 2- 24year old patient with h/o swelling. A oval shaped hypoechoic well defined sol without any infiltration into underlying soft tissues is seen—fibroadenoma right breast.

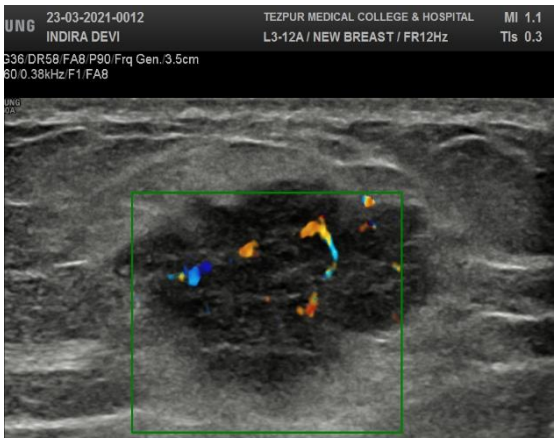
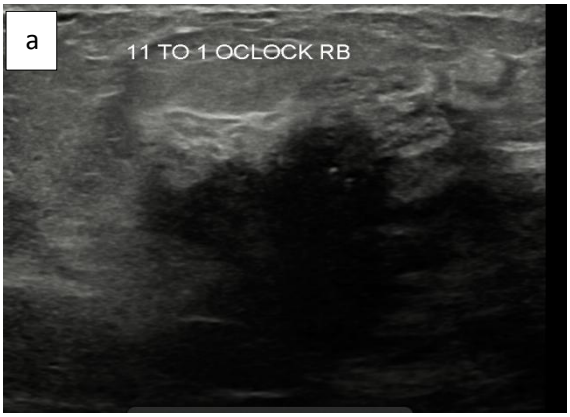
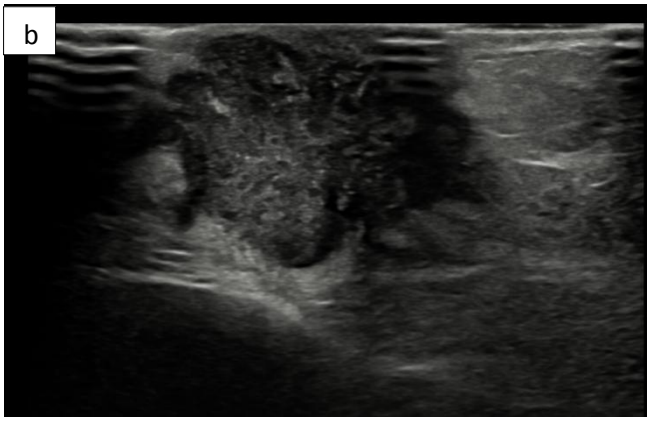


Fig 3- A 30-year female came with h/o nipple discharge and swelling in the breast. On USG a lobulated SOL having angulated margins was found at the upper inner quadrant of the right breast. Internal vascularity present on colour doppler. Report was given as s BIRADS 4a lesion. Biopsy revealed infiltrating ductal carcinoma.





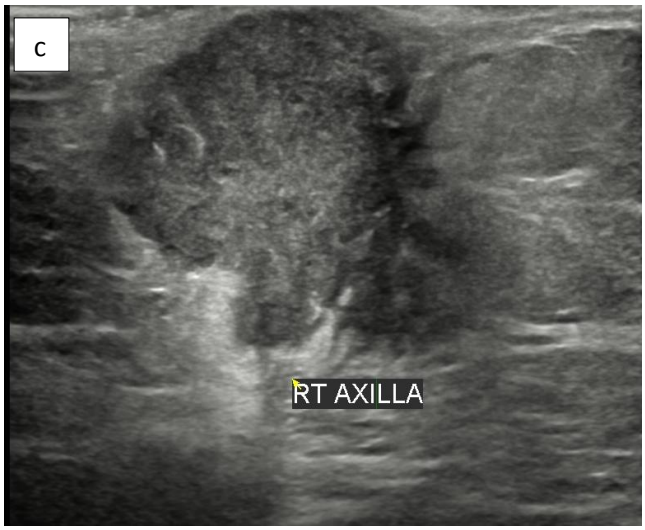


Fig 4- lobular carcinoma of the right breast with concurrent fibroadenoma and metastatic right axillary lymph adenopathy. (a) an ill-defined hypoechoic SOL with posterior acoustic shadowing (b) another hypoechoic lobulated SOL in 7 to 9 o'clock position of the right breast. (c) large multilobulated SOL in the right axilla.

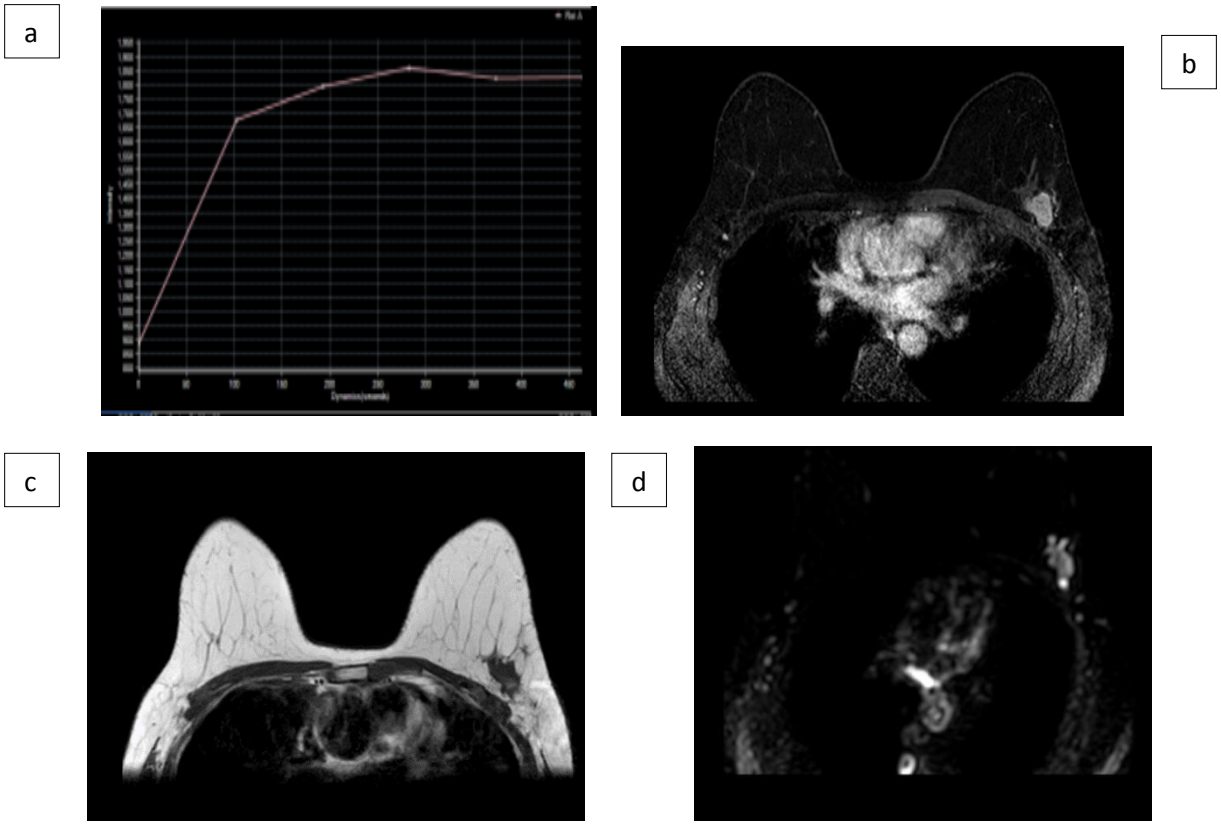


Fig 5- ductal carcinoma in the left breast (a)T1W-ill-defined hypointense lesion with spiculated margin (b) DWI- shows restricted diffusion (c) dynamic post contrast image- moderate to intense heterogeneous enhancement with fine central necrosis (d) type II /

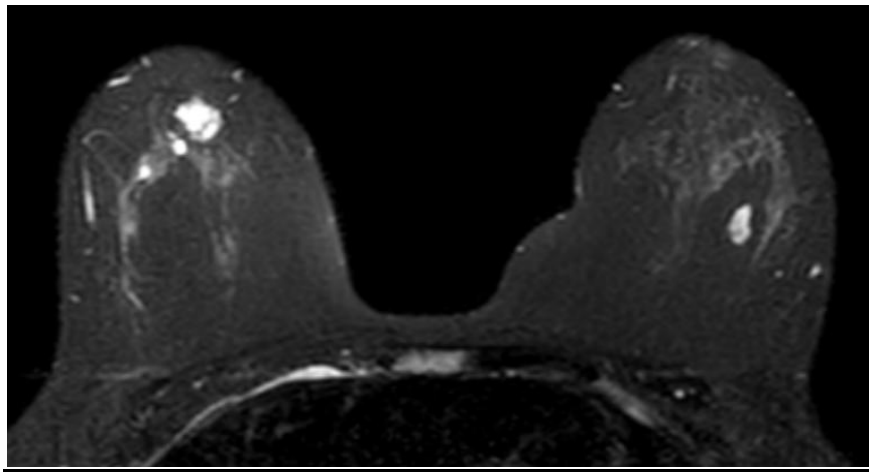


Fig 6 - T2 hyperintense cysts of varying sizes in bilateral breasts (Fibrocystic breast disease)

III. Discussions –

Women frequently present with a palpable breast lump, either self-detected or discovered through a clinical breast examination. A palpable bump can raise understandable concerns even if it is benign. [14]As the most prevalent sign of breast cancer a palpable breast lump, the patient concern is reasonable and hence a timelyand a suitable diagnostic workup is required.[13] However, a lot of people are still unclear regarding particular imaging modalities and sequencing of various investigation workups.[15]

USG is the initial modality of investigation in most of the cases due to its wider availability, cost effectiveness and lack of ionising radiation. [16]According to current recommendations, screening by clinical breast examination and mammography should begin no later than age 30. [17]However, the mammography screening findings that have been reported so far are not encouraging probably due to the dense fibro glandular tissue in young female breasts.[18] The accuracy of USG and MRI has been proved be more in the diagnosisof dense fibroglandular breasts in young females. MR imaging has a high sensitivity but a low specificity in diagnosing malignant breast lesions. [19]DCE-MRI (dynamic contrast-enhanced MRI) has been widely utilised to improve MRI's specificity in identifying breast lesions.[20]

A total of 33 clinically palpable breast lesions were examined at the radiology department from march, 2021 to march, 2022. The cases were stratified by age into those below 25 years, 6 cases (18 %); between 25 and 45 years,13 cases (39.3%); 45 to 65 years 8 cases (24.2%) and those above 65 years, 6 cases (18.2%). The lesions were primarily classified into benign, and malignant lesions. There were 21 cases (63.6 %) benign, 12 cases (36.4%).

In diagnosis of malignant mass by USG, 11 (33.3%) cases were diagnosed as malignant and 22 (66.7 %) cases as other than malignant. 10 out of the that were sonographically diagnosed as malignant lesions also proved as malignant lesion by histopathology and one came to be other than malignant. Out of 22 sonographically diagnosed cases of other than malignant lesions, 1 came out to be malignant histopathologically.

Thus, in our study, in diagnosis of malignant lesion, USG showed, sensitivity of 90.9 %, specificity 95.4 and accuracy of 94.3%.In diagnosis of benign lesion by USG, sensitivity was 95.4 %, specificity 90.9 and accuracy was 94.2%.According to a global study when only low- and middle-income country data were considered, ultrasound maintained a diagnostic sensitivity of 89.2% and specificity of 99.1% in evaluation of malignant lesions.[21] In another study Sensitivity and specificity of USG in evaluation of breast malignancy were 100% and 88.5% respectively.[22]

However, on MRI among the total 33 cases, 11 were reported as malignant and 22 cases as other than malignant. All the 11cases that were diagnosed as malignant lesions also proved as malignant lesion by histopathology. Out of 22 sonographically diagnosed cases of other than malignant lesions, 1 came out to be malignant histopathologically. In our study MRI revealed sensitivity of 91.7 %, specificity of 100 % and accuracy of 96.9 % in detection of malignant lesions. In a study by PelinSeher et al, the sensitivity, specificity of MRI for the detection of cancer were 100% and 92% respectively. [23] A systematic, critical meta-analysis assessing MR test performance in 41 studies reported sensitivities ranging from 63% to 100% and specificities ranging from 21% to 100% in evaluation of suspicious breast lesions.[24]

IV. Conclusion –

Both MRI and USG are appropriate for evaluation of females with clinically palpable breast lumps. Both USG and MRI have the advantage of lacking the ionizing radiation. However due to cost effectiveness and wider availability, USG still remains as the preliminary method of evaluation of the patients coming with breast lumps in this part of the country.

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