

Original article:

Study of evaluation of mammographic features and sonographic findings of breast masses

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Abstract

Introduction: For palpable breast lesions characterization of lesion is very important in further management. All breast lesions are not malignant and all the benign masses do not progress to cancer. Precision of the diagnosis can be increased by radiological imaging (Digital Mammography, Ultrasonography) and pathological diagnosis

Material and methods: This study was carried out in Department of Radiodiagnosis at our hospital which is a tertiary care centre. The study included 100 patients who were referred to Department of Radiodiagnosis at our hospital for mammography & sonography with clinical suspicion of breast mass. All the patients (IPD & OPD) with clinical suspicion of breast mass, complaints of palpable breast mass, pain, nipple discharge, nipple retraction irrespective of age & sex were included in present study.

Results: Out of 75 malignant lesions USG individually detected 70 lesions & missed 5 lesions. These missed 5 cases were DCIS & only calcifications were there which were not picked up on USG.

USG specificity is 64%. This low specificity of USG is because USG incorrectly diagnosed 9 lesions. 2 Cellular fibroadenoma cases were suspicious for malignancy on USG but were correctly identified on combined imaging. 4 Cases of proliferative disease with atypia were incorrectly diagnosed on USG & proved benign on HP. 2 Ductal papilloma were suspicious on USG but were correctly diagnosed on combined imaging.

Conclusion: From present study, we conclude diagnostic accuracy of mammography (93%) and is superior to that of USG (86%). Combined mammography and USG has 96% diagnostic accuracy.

Keywords: Ultrasonography, mammography, breast mass

Introduction:

For palpable breast lesions characterisation of lesion is very important in further management. All breast lesions are not malignant and all the benign masses do not progress to cancer. Precision of the diagnosis can be increased by radiological imaging (Digital Mammography, Ultrasonography) and pathological diagnosis⁽¹⁾.

Mammography is a well-defined and widely accepted technique to evaluate clinically suspected breast lesions and screening for breast cancer. USG is an useful adjunctive modality and helps in characterizing a mammographically detected abnormality, especially in patients with dense breast⁽²⁾. It is also very useful in differentiating solid and cystic lesions. Sensitivity and specificity of USG or mammography is higher if USG and mammography are combined. When a lesion is detected using either modality it is generally confirmed by histopathology which facilitates a definitive diagnosis.

Material and methods:

This study was carried out in Department of Radiodiagnosis at our hospital which is a tertiary care centre .The study included 100 patients who were referred to Department of Radiodiagnosis at our hospital for mammography & sonography with clinical suspicion of breast mass.

Selection of patients:

Inclusion criteria:

1. All the patients(IPD & OPD) with clinical suspicion of breast mass , complains of palpable breast mass, pain, nipple discharge, nipple retraction irrespective of age & sex.

Exclusion criteria:

1. Seriously ill patients
2. Pregnant patient
3. Patient refuse to be part of the study

Informed written consent was obtained from the selected patients.

Mammography and sonography were performed as an initial imaging examination using:

- FUJIFILM model No.399Y10004 in two views (i.e. cranio-caudal & medio-lateral oblique views)
- Linear (5412/5-16MHz) transducer of ALOKA prosound alpha 7 ultrasound machine.

The features of mammography will be then characterized into benign and malignant lesion according to mammography BIRADS Lexicon.

Table No 1. Distribution of study objects according to shape of lesion

USG	Cytohistopathology		Total	Percent
	Benign	Malignant		
No mass	0	7	7	7.0
Oval	14	5	19	19.0
Round	11	3	14	14.0
Irregular	0	60	60	60.0
Total	25	75	100	100.0

(P value <0.05 is significant.)

Shape- Significant (p value <0.000001). Oval & Round - benign (p value <0.000001) & Irregular - malignant (p value<0.000001)

Table No 2. Distribution of study objects according to margin of lesion on USG

USG	Cytohistopathology		Total	Percent
	Benign	Malignant		
Circumscribed	12	1	13	13.0
Indistinct	5	24	29	29.0
Angular	2	3	5	5.0
Microlobulated	4	21	25	25.0
Spiculated	2	19	21	21.0
NA	0	7	7	7.0
Total	25	75	100	100.0

Margin - significant (p value<0.05).Circumscribed- Benign (p value<0.05).

-Indistinct (p value-0.04) ,Microlobulated(p value<0.03),Spiculated(p value<0.03)-malignant.

Table No 3. Sensitivity & specificity of each investigation as compared with cytohistopathology

	SENSITIVITY	SPECIFICITY	PPV	NPV
MAMMO	98.6%	76%	93%	95%
USG	93%	64%	88.6%	76%
COMBINED	100%	84%	95%	100%

Discussion:

In this study most common age group age group affected was 36-45 years followed by 56-65 years. Most common age group affected by benign lesions was 36-45 years & by malignant lesions was 56-65 years. All patients were female. Out of 100 patients 25 were benign & 75 were malignant. This high number of malignant lesions is attributed to the association of state cancer institute with our tertiary centre. Also most of the patients came to our department for diagnosis rather than screening.

Out of 100 lesions mammography was able to detect 98 lesions & failed to detect 2 lesions because of dense breasts. This high level of detection is because mammography was able to demonstrate suspicious calcifications even in the absence of palpable mass .

High sensitivity of mammography 98.6% is attributed to following:

1. All except one malignant lesions were detected.
2. Type B breast predominance in malignant lesions
3. Calcifications in non-palpable lesions.

One IDC was incorrectly diagnosed due to extremely dense breast.

Low specificity of mammography 76% is due to –

1. Missed lesions in Dense breasts.

2. One granulomatous disease & 4 Cases of proliferative disease with atypia were incorrectly diagnosed on mammography & proved benign on HP.

24% reduction in specificity of mammography is because mammography incorrectly diagnosed 5 lesions & missed 1 lesion. One Duct papilloma was missed on mammography due to dense breast. One granulomatous disease & 4 Cases of proliferative disease with atypia were incorrectly diagnosed on mammography & proved benign on HP.

Out of 100 lesions USG was able to detect 95 lesions & failed to detect 5 lesions.

Out of 75 malignant lesions USG individually detected 70 lesions & missed 5 lesions. These missed 5 cases were DCIS & only calcifications were there which were not picked up on USG.

USG specificity is 64%. This low specificity of USG is because USG incorrectly diagnosed 9 lesions. 2 Cellular fibroadenoma cases were suspicious for malignancy on USG but were correctly identified on combined imaging. 4 Cases of proliferative disease with atypia were incorrectly diagnosed on USG & proved benign on HP. 2 Ductal papilloma were suspicious on USG but were correctly diagnosed on combined imaging.

Cystic nature of one fibrocystic disease & one galactocoele were correctly diagnosed by USG.

All malignant lesions were correctly identified on combined imaging resulting in 100% sensitivity. 4 Cases of Proliferative disease with atypia were suspicious on combined imaging & subsequently proved to be benign breast disease on HP & attributed to 84% specificity of combined imaging.

In our study for malignant & benign breast lesions, the positive predictive value was 93% and the negative predictive value was 95% on mammography. Mammographic BI-RADS with cytohistopathology was 98.6% sensitive and 76% specific. Our results were slightly different from other studies which evaluated the sensitivity of radiological grading in predicting malignancy. In present study sensitivity was slightly more than Phurailatpam et al³, Tiwari et al⁴, Zonderland et al⁵, Nandan Kumar et al⁶ and specificity was less than Phurailatpam et al³, Tiwari et al⁴, Zonderland et al⁵, Nandan Kumar et al⁶. Tiwari et al⁴ 77.8 sensitivity & 97.7 specificity & 87.5 % PPV. PPV of BI-RADS 5 ranged from 68-100%.

Conclusion:

From present study, we conclude diagnostic accuracy of mammography (93%) and is superior to that of USG (86%). Combined mammography and USG has 96% diagnostic accuracy.

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