



**ORIGINAL RESEARCH PAPER**

**Radio-Diagnosis**

**STUDY OF CORRELATION OF USG FINDINGS IN BREAST LESIONS WITH HISTOPATHOLOGY**

**KEY WORDS:** USG

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**ABSTRACT**

**Introduction:** Breast masses are common in all age groups and encompass a spectrum of inflammatory, benign and malignant lesions. Previous study results have demonstrated the diagnostic benefits of USG in differentiating benign from malignant breast disease<sup>8</sup>. Identification of lesions suspected of malignancy generates the need of cytological or histopathological evaluation through a minimally invasive procedure. In present study, we aimed to find if USG has a differentiating role in diagnosing malignant lesions compared to histopathological evaluation. **Materials and Methods:** 30 female patients between age 20 to 80 years with a breast lesion attending the Surgical, Medical, and General outpatient department of our hospital were enrolled. All patient underwent ultrasound scan. 12 study participants had ultrasound-guided biopsy done, whereas the remaining 18 patients had open biopsy. **Observations and Results:** Majority cases i.e., 27 (90 %) had size of lesion between 11 to 20 mm. 21 (70 %) had single lesion. Most of the lesions were located in upper quadrant. Oval shape was present in majority cases i.e., 23 (77 %). Circumscribed margin found in maximum i.e., 24 (80 %) cases. Vascularity found in 8 (27 %) & majority i.e., 23 (77 %) had hypoechoic echogenicity. benign cases on USG were 24 whereas on HPE were 22. 2 cases later found malignant. Sensitivity, specificity, PPV & NPV of USG was 75 %, 100 %, 100 % & 91.67 % respectively **Conclusion:** Present study showed a significant positive correlation between the sonographic findings and histopathological diagnoses of breast masses. USG helps in avoiding invasive investigations to an extent in breast lesions

**INTRODUCTION**

Breast masses are common in all age groups and encompass a spectrum of inflammatory, benign and malignant lesions<sup>1,2,3</sup>. Most common symptoms are breast pain, nipple discharge, and a palpable mass<sup>1</sup>. These are also the common breast problems for which women consult a physician. Early menarche (before the age of 12), late natural menopause (after the age of 55), not bearing children, and first pregnancy over the age of 30 are the different factors that increase the risk of breast cancer<sup>2</sup>. Breast imaging is the radiologic start point for the assessment of breast masses which plays a vital role in the multidisciplinary approach to the management of breast disease<sup>4</sup>. Ultrasonography (USG) is useful in the detection of breast masses as well as in the differentiation of masses. It has widespread acceptance as a diagnostic tool for the evaluation of breast disorders<sup>5</sup>. Some breast diseases that are obscured by dense breast tissue can be detected with USG. USG has been found better in the detection of breast cancer if the patient is young or the masses are small<sup>6,7</sup>. Previous study results have demonstrated the diagnostic benefits of USG in differentiating benign from malignant breast disease<sup>8</sup>. Identification of lesions suspected of malignancy generates the need of cytological or histopathological evaluation through a minimally invasive procedure. In present study, we aimed to find if USG has a differentiating role in diagnosing malignant lesions compared to histopathological evaluation.

**MATERIAL AND METHODS**

Present study is a cross sectional prospective study conducted from duration June 2022 to May 2023 under department of radiology, MGM medical college & hospital, Chatrapati Sambhajnagar. Institutional ethics committee permission was taken prior to commencement of study. 30 breast lesion women fulfilling inclusion and exclusion criteria were enrolled. Study was explained to all participants and written informed consent was obtained.

**Inclusion Criteria**

30 female patients between age 20 to 80 years with a breast

lesion attending the Surgical, Medical, and General outpatient department of our hospital

**Exclusion Criteria**

1. Patients without a demonstrable breast mass
2. Patients with ulcerated/fungating mass in the breast
3. Patients with a previous history of breast biopsy

**Procedure**

After obtaining data on sociodemographic variables & relevant clinical history patient underwent ultrasound scan. It was done at the radiology department of the institution using the \_\_\_\_\_ Ultrasonic Diagnostic Imaging System having Doppler facility using the 7.5– 10 MHz linear array transducer. Procedure was carried out according to the standard protocol for performing a breast ultrasound scan. The images were acquired & saved on the machine. Patients had biopsies taken either by ultrasound guidance or open biopsy. 12 study participants had ultrasound-guided biopsy done, whereas the remaining 18 patients had open biopsy. histopathologic diagnoses were obtained thereafter. Sonographic findings, histopathological outcome as well as histopathological diagnosis mentioned on case record form.

**Statistical analysis**

Statistical analysis was performed using SPSS software, version 20. Data are expressed as mean ± SD and frequency with percentages N (%). Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) were determined.  $\chi^2$ -test used if required to evaluate qualitative data and to study association between two variables. Statistical significance was assumed if P value less than 0.05.

**OBSERVATION AND RESULT**

**Table 1: Age distribution**

Sr No.	Age (Years)	Number of cases N (%)
1	20-35	11 (37 %)
2	36-50	13 (43 %)
3	50-65	4 (13 %)
4	65-80	2 (7 %)

**Table 1** showing distribution of age, shows that majority of patients were from age group 36 to 50 (43 %) & 20 to 35 (37 %).

**Table 2: Symptoms distribution**

Sr No.	Symptoms	Present N (%)	Absent N (%)
1	Breast mass	18 (60 %)	12 (40 %)
2	Pain	13 (43 %)	17 (57 %)
3	Nipple discharge	4 (13 %)	26 (87 %)
4	Skin/nipple retraction	6 (20 %)	24 (80 %)

As shown in **Table 2** breast mass was present in 18 (60 %) cases, pain associated was found in 13 (43 %), nipple discharge in 4 (13 %) & Skin/nipple retraction in 6 (20 %)

**Table 3: USG findings**

Sr No.	USG findings	Number of cases N (%)
1	Size (mm)	
	a. <10	1 (3 %)
	b. 11 to 20	27 (90 %)
2	Number	
	a. Single	21 (70 %)
3	Location (Quadrant)	
	a. Upper outer	10 (33 %)
	b. Upper inner	8 (27 %)
	c. Lower outer	7 (23 %)
4	Shape	
	a. Oval	23 (77 %)
	b. Round	1 (3 %)
5	Margin	
	a. Circumscribed	24 (80 %)
	b. Indistinct	6 (20 %)
6	Vascularity	
	a. Absent	22 (73 %)
6	Echogenicity	
	a. Heteroechoic	4 (1 %)
	b. Hypoechoic	23 (77 %)
	c. Isoechoic	3 (22 %)

**Table 3** showing USG findings shows that, majority cases i.e., 27 (90 %) had size of lesion between 11 to 20 mm. 21 (70 %) had single lesion. Most of the lesions were located in upper quadrant. Oval shape was present in majority cases i.e., 23 (77 %). Circumscribed margin found in maximum i.e., 24 (80 %) cases. Vascularity found in 8 (27 %) & majority i.e., 23 (77 %) had hypoechoic echogenicity

**Table 4: Diagnosis**

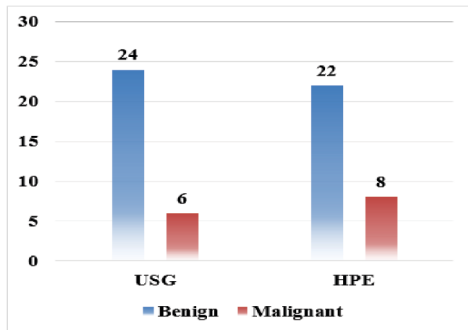
Sr No.	Diagnosis	USG N (%)	HPE N (%)	Sensitivity	Specificity	PPV	NPV
1	Benign	24 (80 %)	22 (73 %)	75 %	100 %	100 %	91.67 %
2	Malignant	6 (20 %)	8 (27 %)				
3	Total	30 (100 %)	30 (100 %)	-	-	-	-

As shown in **Table 4** benign cases on USG were 24 whereas on HPE were 22. 2 cases later found malignant. Sensitivity, specificity, PPV & NPV of USG was 75 %, 100 %, 100 % & 91.67 % respectively (**Graph 1**)

**DISCUSSION**

Breast cancer has become more prevalent nowadays. Early clinical detection is important. USG can detect smaller non-palpable cancers which may be skipped on high-quality mammography. Excellent visualization of extended

intraductal component using USG has been reported in some studies. An accurate correlation of USG findings with their corresponding histopathologic features is considered important in management. Present study was undertaken with this perspective in 30 women with a breast lesion to assess the efficacy of USG findings in detecting type of lesion in comparison to histopathological study.



**Graph 1: Diagnosis**

In present study majority of patients were from age group 36 to 50 (43 %) & 20 to 35 (37 %). In similar study by **Akinnibosun-Raji HO et al (2022)**<sup>9</sup> age of the patients were between 16 and 75 years, with a mean of 33.03 ± 12.32. **Thomas R et al (2022)**<sup>10</sup> in their study found out of the 33 malignant lesions, 25 were of age more than 50 years. Benign lesions were found mostly in the age group 31-50 years. Of the 40 benign lesions, 34 were in the age group less than 50 years. In present study breast mass was present in 18 (60 %) cases, pain associated was found in 13 (43 %), nipple discharge in 4 (13 %) & Skin/nipple retraction in 6 (20 %). In similar study by **Akinnibosun-Raji HO et al (2022)**<sup>9</sup> all the patients presented with breast lump/mass. 46 (28.7%) patients had associated breast pain and only 8 (5.0%) had associated nipple discharge. In present study majority cases i.e., 27 (90 %) had size of lesion between 11 to 20 mm. 21 (70 %) had single lesion. Most of the lesions were located in upper quadrant. Oval shape was present in majority cases i.e., 23 (77 %). Circumscribed margin found in maximum i.e., 24 (80 %) cases. Vascularity found in 8 (27 %) & majority i.e., 23 (77 %) had hypoechoic echogenicity. Benign cases on USG were 24 whereas on HPE were 22. 2 cases later found malignant. Sensitivity, specificity, PPV & NPV of USG was 75 %, 100 %, 100 % & 91.67 % respectively. In similar study by **Akinnibosun-Raji HO et al (2022)**<sup>9</sup> sensitivity, specificity, PPV and NPV for the correlation of the sonographic findings and histopathological diagnoses were found to be 79.5%, 98.3%, 93.9% and 93.7% respectively. **Thomas R et al (2022)**<sup>10</sup> in their study found margin of the majority of the benign lesions (95%) was circumscribed. Among malignant lesions four (12.1%) had indistinct margins, 20 (60.6%) had spiculated, and nine (27.3%) had micro-lobulated margins. Most of the lesions were localized to upper outer quadrant (19%-26%) followed by lower outer (17%-23.3%) and lower inner quadrants (17%-23.3%). Among benign lesions, 26 were between 11-20 mm and 13 were more than 2 cm. Among malignant lesions, most of them were more than 2cm. **Laila Caroline Freitas e Silva et al (2017)**<sup>11</sup> in their study found 26 out of the 154 were circumscribed masses. **Kentaro Tamaki et al (2010)**<sup>12</sup> in their study found an irregular shape (72%), a not parallel orientation (42%), a hypoechoic or complex echo pattern (92%) in invasive cancers.

**CONCLUSION**

In present study sensitivity, specificity, PPV & NPV of USG was found as 75 %, 100 %, 100 % & 91.67 % respectively. Present study showed a significant positive correlation between the sonographic findings and histopathological diagnoses of breast masses. USG helps in avoiding invasive investigations to an extent in breast lesions.