



## ULTRASOUND OF THE PALPABLE BREAST MASS

Dr Vineet Popli

MBBS DNB, Department of Pediatrics, Dr Baba Saheb Ambedkar Medical College and Hospital, Rohini, Delhi – 110085

Dr Manju Bala Popli\*

MBBS MD, Department of Radiological Imaging, Institute of Nuclear Medicine and Allied Sciences (INMAS), Delhi-110054 \*Corresponding Author

## ABSTRACT

Increased awareness of breast cancer makes a patient with palpable breast mass seek medical advice. All palpable masses neither are cancerous nor do they need surgical intervention. Ultrasound is the modality of choice to carry out evaluation of such masses. 797 patients with complaint of a palpable breast mass were evaluated by ultrasound over a period of 2 yrs. Ultrasound had sensitivity 93.4 %, specificity 97.9 %, positive predictable value 89.9%, negative predictable value 98.7% and diagnostic accuracy of 97.1% in this study. Use of ultrasound as primary imaging modality for evaluation of a palpable breast mass results in improved health care of the patient. It necessitates biopsy or surgical intervention only when required.

**KEYWORDS :** Ultrasound, Breast, Palpable mass.

## Introduction:

A clinical breast examination if done systematically is quite effective in detecting a mass in the breast. It can also help in assessing whether a mass is benign or malignant. However, not all well defined lesions are benign. It is also difficult to differentiate an inflammatory breast cancer from the breast infections by clinical examination alone.

An imaging modality like Ultrasound is of immense help in further evaluation of a palpable mass<sup>1-4</sup>. It is an economical, radiation free modality and is also easily accessible. It can effectively distinguish cysts from a solid breast mass. It has more sensitivity than mammography for detecting lesion in a dense breast. It is superior to mammography in diagnosing clinically palpable breast masses. Use of ultrasound can reduce the number of biopsies performed for benign cyst and saves the patient from anxiety and discomfort. It also helps to evaluate suspicious breast mass, which require immediate biopsy rather than follow up

## Materials and Methods:

The study period was 2 years. Patients with a complaint of palpable mass were referred for evaluation of the breast by ultrasound, which was done using MyLab60 (Esoate) having 7-12 MHz transducer. The mass, when detected, was assessed for margins, internal echo pattern, AP / Transverse diameter, Posterior Enhancement, mobility and compressibility. Finally lesion was characterized as benign, malignant or suspicious. Sonography results were compared with FNA/ histology findings.

## Results:

797 patients with complaints of palpable mass were referred for ultrasound breast. The age of the patient range from 13-83 yrs. 25 patients were less than 20 years, 4 patients were more than 80 years. Maximum patients were in 40-49 years age group. 21 patients were male.

In 95 patients ultrasound breasts was normal. No well defined mass could be palpated on elaborate systematic examination of the breasts with respect to the complaint of the patient. On history there was complaint of lumpiness, heaviness and tenderness of the breasts more in premenstrual phase as compared to postmenstrual phase in many of these patients. Some patients were not familiar with the correct palpation technique and mistook normal fibroglandular tissue as a mass in the breast. In 191 patients the palpable lump was diagnosed to be a simple cyst on ultrasound. In 21 of these patients additional small satellites cysts were also seen. No other lesion was picked up on detailed ultrasound examination of the rest of the breast.

In rest of the 511 patients, a spectrum of lesions were picked up on ultrasound of the breast (Table 1). Fibroadenoma was the commonest finding (208/511=42.66%). Fibrocystic Disease of the breast (146/511 = 28.57%) was also commonly found. In 76 patients (14.87%), the provisional ultrasound diagnosis was a malignant lesion of the Breast. Benign lesions were more commonly seen. In 57 of these patients with ultrasound image morphology suggestive of benign pathology, a diagnosis was reached by imaging surveillance/ follow up. Rest of the 454 patients underwent FNA/ biopsy/histopathology correlation.

Ultrasound had sensitivity of 93.4 %, specificity 97.9 %, positive predictable value 89.9%, negative predictable value 98.7%, diagnostic accuracy 97.1% for palpable breast mass.

## Discussion:

A palpable breast mass is a cause of worry and makes a woman seek medical advice. Ultrasound is cheap compared to mammography and also easily accessible. There is a frequent request by the clinicians and ultrasound is most of times the first imaging modality used in the assessment of a breast mass. Ultrasound of breast is also a highly recommended imaging modality in a young patient. It is also the imaging modality of choice in expecting and lactating mothers with complaint of breast mass.

Advancements in hardware and software have resulted in better resolution of sonographic images. Ultrasound has become the imaging modality of choice to characterize a mass in the breast. The shape, margins, internal echopattern of the lesion on ultrasound is much better defined. Based on these features ultrasound can distinguish between benign and malignant breast mass<sup>1-4</sup>. In most cases, a biopsy can be avoided. The few cases where the lesion is suspicious, immediate biopsy is prompted.

Ultrasound is an operator based technology. It is must to locate the mass precisely. Palpation of the mass during ultrasound ensures that the mass detected is in fact the cause for the palpable abnormality. When the mass is small, it should be fixed between the two fingers and scanned. Sometimes, a lesion other than the palpable abnormality is picked up and needs a complete workup to rule out an incidental carcinoma.

The goal of ultrasound is to demonstrate that the cause of the palpable mass. If it is benign the patient need not undergo biopsy. A meticulous follow up of the patient is required in many of the cases. A biopsy would be unnecessary where ultrasound shows a hyperechoic fibrous tissue to be the cause of the palpable lump. Palpable and hypoechoic tissue however would need to be further investigated. Intra mammary nodes can also present as palpable

mass. They are most commonly seen in the upper outer quadrant of the breast. Normal lymph nodes are oval, lobulated with a thin echogenic capsule and hyperechoic hilum. Lymph nodes with a round shape, hypoechoic pattern, deformed or absent hilum are suspicious and need to be biopsied even in absence of any obvious lesion in the breast. In males, gynaecomastia is the commonest cause of palpable mass and this was also found in our study.

There have been many previous studies where ultrasound has been used in diagnostic evaluation of breast masses. Lehman et al<sup>1</sup> has shown ultrasound to be 95.7% sensitive and 89.2% specific in their study. Hasni et al<sup>3</sup> found ultrasound to be sensitive in 100%, specific in 85.7%, with positive predictive value 50%, negative predictive value 100% and diagnostic accuracy 87.5% for diagnosing between benign and malignant mass. In our study ultrasound had sensitivity of 93.4%, specificity of 97.9%, positive predictable value of 89.9%, negative predictable value of 98.7%, diagnostic accuracy of 97.1% for malignant breast masses.

Palpable masses are usually benign<sup>5,9</sup>. In our study, fibroadenomas

was the commonest benign finding (208/511=42.66%). Fibrocystic disease was another common finding (146/511 = 28.57%). This is also consistent with histopathological review of breast neoplasms by Dayanand et al<sup>10</sup> where fibroadenoma was the commonest finding followed by fibrocystic disease 41.3% & 16.2% respectively.

In our study 21 patients were males. Gynaecomastia was commonest cause of palpable mass in these patients (12/21). On ultrasound a well defined, hypoechoic, round or oval, solid nodule was seen in subareolar region. Such patients were subsequently followed up. In another male patient aged 73 years, the lesion looked suspicious and was taken up for biopsy.

Ultrasound is an important imaging modality for evaluation of palpable mass of the breast. Benign mass of the breast is more common than the malignant. In the majority of cases, ultrasound demonstrates the benign cause of the palpable mass. These patients need reassurance or follow up. In few cases, a suspicious or malignant mass is detected. These are then sent for immediate biopsy rather than follow up which can delay the diagnosis.

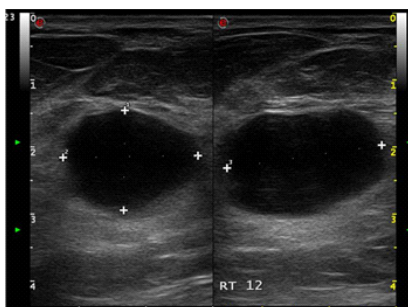
S.NO.	FINDINGS	AGE GROUP								TOTAL
		<20	20-29	30-39	40-49	50-59	60-69	70-79	>/=80	
1.	ABSCCESS	1	4	12	8	3	1	0	0	29
2.	COMPLEX CYST	0	0	1	5	1	1	0	0	8
3.	CYST	3	22	52	78	26	6	3	1	191
4.	DUCTAL ECTASIA	0	2	7	5	4	3	0	0	21
5.	FIBROADENOMA	7	43	71	51	23	11	1	1	208
6.	FIBROCYSTIC DISEASE	2	23	51	49	13	3	0	0	141
7.	FIBROGLANDULAR TISSUE	0	1	1	0	0	0	0	0	2
8.	GALACTOCELE	0	1	0	0	0	0	0	0	1
9.	GYNAECOMASTIA	5	3	0	1	1	2	0	0	12
10.	LIPOMA	0	0	1	4	0	0	0	0	5
11.	LYMPHADENOPATHY	0	1	1	1	2	0	0	0	5
12.	MALIGNANCY	0	6	10	21	18	13	6	2	76
13.	NORMAL	7	23	29	27	7	2	0	0	95
14.	POST OP CHANGES	0	0	0	1	0	0	0	0	1
15.	PSEUDOGYNAECOMASTIA	0	1	0	0	0	0	0	0	1
16.	SEROMA	0	0	0	0	0	1	0	0	1
	TOTAL	25	130	237	252	98	43	10	4	797

**Table 2 Statistical Accuracy of Ultrasound in the Assessment of the Palpable Mass**

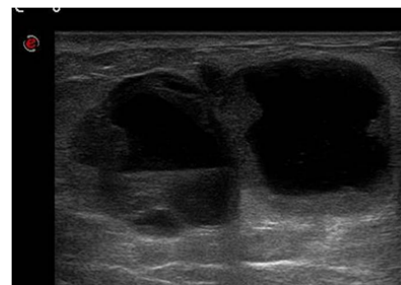
	Biopsy/ Histopathology +ve	Biopsy/ Histopathology -ve
Ultrasound +ve	71 (True Positive:A)	08 (False Positive:B)
Ultrasound -ve	05 (False Negative:C)	370 (True Negative:D)

A+B+C+D=454  
 Sensitivity= A/A+C = 93.4%  
 Specificity = D/B+D = 97.9%  
 PPV=A/A+B=89.9%  
 NPV=D/C+D= 98.7%  
 Diagnostic Accuracy = A+D/ A+B+C+D=97.1%

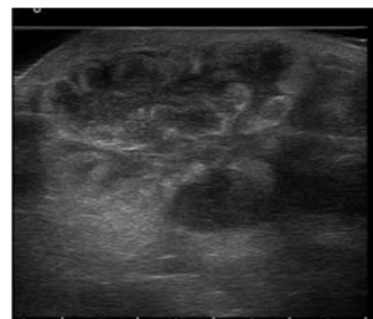
**Fig 1: A well defined cystic SOL on ultrasound. No intervention required.**



**Fig 2: Complex cystic SOL. Patient needs reassurance and follow up.**



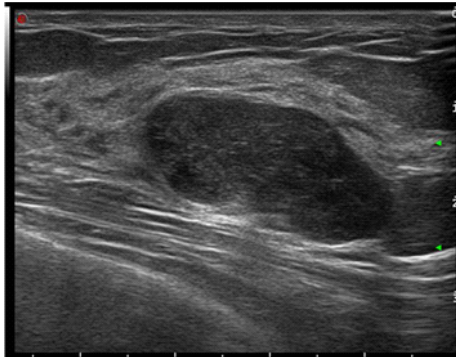
**Fig 3: A complex cystic lesion in a 27 years old lactating patient presenting with a painful palpable mass suggests Galactocele.**



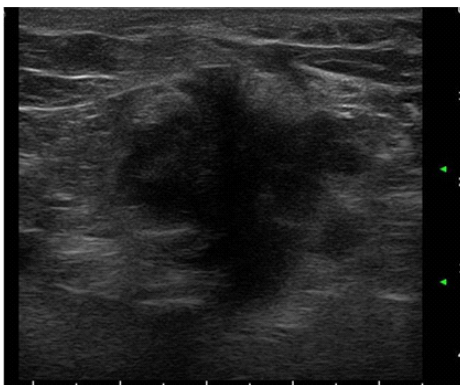
**Fig 4: Post operative seroma: a well defined cystic lesion with homogenous low level echoes.**



**Fig 5: A well defined mobile, oval lesion with homogenous internal echopattern is a fibroadenoma**



**Fig 6: A spiculated lesion with heterogenous echopattern and AP diameter more than transverse is suggestive of malignant lesion.**



**References**

1. Lehman CD, Lee CI, Loving VA, Portillo MS, Peacock S, DeMartini WB . Accuracy and Value of Breast Ultrasound for Primary Imaging Evaluation of Symptomatic Women 30–39 Years of Age. *AJR* 2012; 199:1169–1177
2. Gonzaga MA. How Accurate is Ultrasound in Evaluating Palpable Breast Masses ? *Pan Africa Medical Journal – ISSN: 1937- 8688.*
3. Hasni H, Meah FA, Norlia A, Sharifah NA, Zulfiqar A. Ultrasound in the Assessment o f the Palpable Breast Mass. *Med J Malaysia* 2004; 59:486-494
4. Yang WT, Mok CO, King W, Tang A, Metreweli C. Role of High Frequency Ultrasonography in the Evolution of Palpable Breast Masses in Chinese Women: Alternative to Mammography? *J Ultrasound Med* 1996; 15:637-644.
5. Abhijit M.G., Anantharaman D, Bhoopal S, Ramanujam R. Benign breast diseases: experience at a teaching hospital in rural India. *Int J Res Med Sci.* 2013; 1:73-78
6. Bagale P, Dravid NV, Bagale S, Ahire N. Clinicopathological Study of Benign Breast Diseases. *Int J Health Sci Res.* 2013; 3:47-54.
7. Singh UR, Thakur AN ,Shah SP, Mishra A. Histomorphological Spectrum of Breast Diseases *J. Nep Med Assoc.* 2000; 39:338-341
8. Klein S. Evaluation of Palpable Breast Masses. *Am Fam Physician* 2005; 71: 1731-1738.
9. Sudhakar R, Pramila RG. Spectrum of breast lesions in young females. *World J Pharm Sci* 2015; 3: 2490-2496.

10. Dayanand V, Shashidhar HB, Sandhya M, Ashwini NS, Bharathi M. Spectrum of Breast Neoplasms in Females: A 10 Years Histopathological Review in a Tertiary Care Hospital *International Journal of Scientific Study* 2015 ; 3 :79-84