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Role of ultrasonograph in detecting palpable breast masses: A clinical study

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Abstract
Background: Most breast cancers occur in women older than 50 years. So to reduce the lesions to occur, the exact identification of the pathology is very essential in order to achieve the best treatment option for the patient. Among various imaging modalities that are available with us, ultrasonography (USG) is the important one. The present study was conducted to establish the role of ultrasound (USG) in assessment of palpable breast masses.
Materials & Methods: The present study was conducted in the department of Radiodiagnosis in year 2015. It included 85 women presented to the department of obstectrics and gynaecology with palpable breast masses. FNAC was performed in first visit. Ultrasonograph was done using 3.5 MHz tranducer. The masses were evaluated according to their margins, internal echoes, posterior echoes, depth-width ratio and compressibility. Lesions were classified either benign or malignant depending on presence of malignant findings. If no findings were seen then it was labeled as benign. If > 50% finding were seen then was labelled as malignant and intermediate if findings were < 49%.
Results: Age group 30- 40 years consisted of 5 patients, 40-50 years had 32 patients and 50-60 years comprised of 48 patients. The difference was significant (P- 0.05). 59 lesions were benign (70%), 8 (10%) were intermediate and 18 (20%) were malignant. The difference was significant (P- 0.05). Histopathology report showed that 52 lesions were benign, 20 were malignant and 13 were inconclusive. Whereas USG reported that 59 were benign and 18 were malignant. Margins were well defined (50), smooth (4) and lobulated (5). Internal echoes were homogenous (38), anechoic (4) and hypoechoic (40). Lesion was compressible in 48 cases. 5 had either ill defined or irregular margins. 1 showed echogenic rim and in 9 cases internal echoes was inhomogenous.
Conclusion: Maximum cases were seen in older women more than 50 years of age. Ultrasonography proved to be beneficial in detecting palpable breast masses.

Keywords: breast, lobulated, ultrasonograph

1. Introduction

Lesions in breast are becoming common nowadays. Though, most masses are benign, breast cancer is the most common cause of death in women. Most breast cancers occur in women older than 50 years. So to reduce the lesions to occur, the exact identification of the pathology is very essential in order to achieve the best treatment option for the patient. Among various imaging modalities that are available with us, ultrasonography (USG) is the important one. Its use in breast imaging was first described in 1951. With recent advancement in USG, it has now become an important technique for the investigation of breast related pathologies [1].

Among various breast masses, the foremost important aim is to differentiation cysts from solid masses. The important advantage of USG is that it uses non- ionizing radiations. It is not harmful for patient. With this method, the number of surgical excisions has been reduced tremendously [2].

There are few recommendations such as ultrasonography-guided CNB should be considered to diagnose malignancy in women with palpable breast lesions. In young women with dense breast tissue, ultrasonography should be used rather than mammography to detect breast lesions etc. Its use in young patient with a palpable breast mass is advisable. Young breasts are more sensitive to radiation and breast cancer in this age group is relatively rare. It is desirable to limit the radiation exposure in young patients unless the woman has either a personal or strong family history of breast cancer [3].

Apart from detection of palpable masses, evaluation for abscess and guidance for interventional procedures are other uses of USG. It is very effective in the detection of an abscess cavity and it can guide either surgical or percutaneous drainage if necessary. Its role in guiding percutaneous procedures such as cyst aspiration, core biopsy, fine needle aspiration cytology, and wire localization of sonographically visible breast lesions is well recommendable [4].

Hence the present study was conducted to establish the role of ultrasound (USG) in assessment of palpable breast masses.

2. Materials & Methods

The present study was conducted in the department of Radiodiagnosis in year 2015. It included 85 women presented to the department of obstectrics and gynaecology with palpable breast masses. Patients were informed regarding the study and informed written consent was obtained.

FNAC was performed in first visit. Ultrasonograph was done using 3.5 MHz tranducer. The masses were evaluated according to their margins, internal echoes, posterior echoes, depth-width ratio and compressibility. Lesions were classified either benign or malignant depending on presence of malignant findings. If no findings were seen then it was labeled as benign. If > 50% finding were seen then was labelled as malignant and intermediate if findings were < 49%.

Results were tabulated and subjected to statistical analysis for correct inferences. P value < 0.05 was considered significant.

3. Results

Table 1 shows that age group 30- 40 years consisted of 5 patients, 40-50 years had 32 patients and 50-60 years comprised of 48 patients. The difference was significant (P-0.05). Fig 1 shows that 59 lesions were benign (70%), 8 (10%) were intermediate and 18 (20%) were malignant. The difference was significant (P- 0.05). Fig 2 shows that histopathology report showed that 52 lesions were benign, 20 were malignant and 13 were inconclusive. Whereas USG reported that 59 were benign and 18 were malignant.

Table 2 shows that margins were well defined (50), smooth (4) and lobulated (5). Internal echoes were homogenous (38), anechoic (4) and hypoechoic (40). Lesion was compressible in 48 cases. Table 3 shows that 5 had either ill-defined or irregular margins. 1 showed echogenic rim and in 9 cases internal echoes was inhomogenous.

Table 1: Distribution of patients on basis of age

Age group	Number	P value
30-40	5	0.05
40-50	32	
50-60	48	

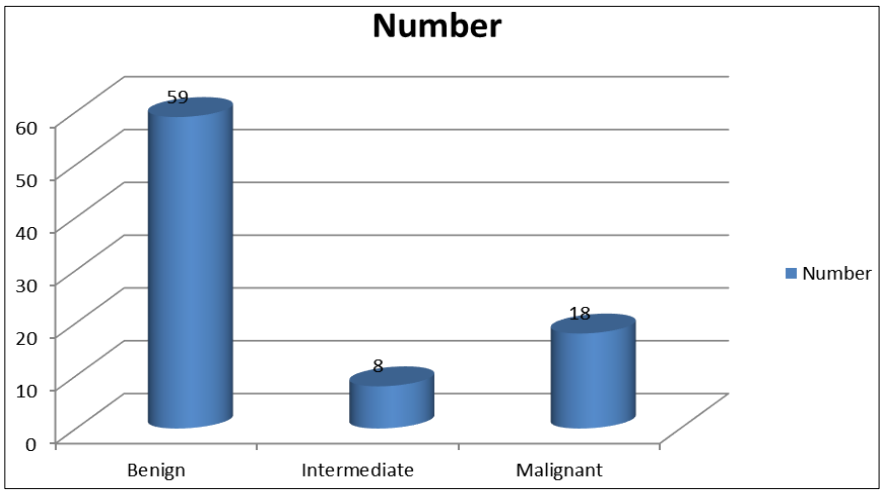

Fig 1: USG findings

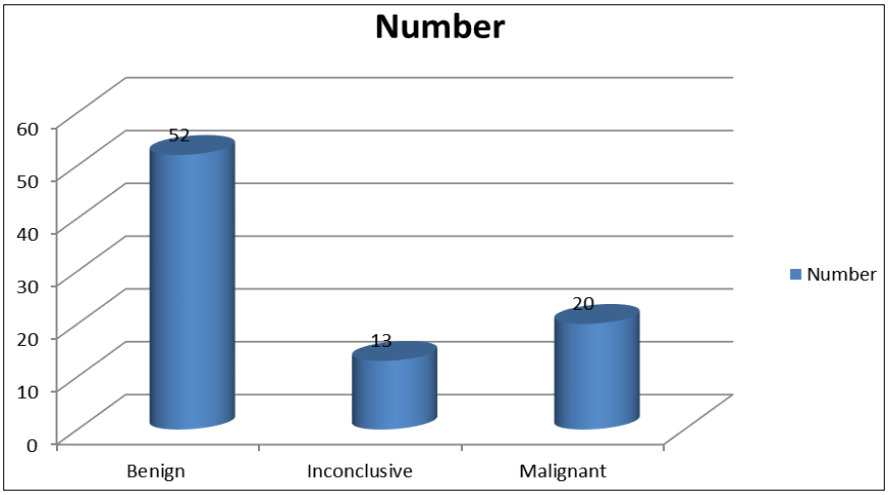

Fig 2: Comparison of Ultrasound Findings with histopathology

Table 2: Ultrasound Characteristics Seen in Confirmed Benign Masses

USG characteristics	Benign USG characteristics	No. of confirmed benign lesion	Malignant USG characteristics	No. of confirmed benign lesion
Margins	Well defined	50	Ill defined	2
	Smooth	4	Irregular	-
	Lobulated	5	Echogenic rim	1
Internal echoes	Homogenous	38	Inhomogenous	8
	Anechoic	4	-	-
	Hypoechoic	40		
Posterior echoes	Enhancement	38	Shadow	1
	No change	5	Mixed	6
D/W ratio	Less than 1	46	1 or greater	4
Compressibility	Compressible	48	Incompressible	5

Table 3: Ultrasound Characteristics Seen in Confirmed Malignant Masses

USG characteristics	Benign USG characteristics	No. of confirmed Malignant lesion	Malignant USG characteristics	No. of confirmed benign lesion
Margins	Well defined	1	Ill defined	3
	Smooth	-	Irregular	2
	Lobulated		Echogenic rim	1
Internal echoes	Homogenous	-	Inhomogenous	9
	Anechoic		-	-
	Hypoechoic	1		
Posterior echoes	Enhancement	1	Shadow	-
	No change	-	Mixed	6
D/W ratio	Less than 1	2	1 or greater	5
Compressibility	Compressible	48	Incompressible	18

4. Discussion

Breast cancer is quite common in women in later age group. Factors favouring cancer are early age of menarche, later age of menopause, nulliparity, late age of first pregnancy, obesity, high dose exposure to radiation, not breast feeding, history of benign breast lesion, alcohol consumption, a diet high in animal fat and family history of breast cancer [5].

This study tried to establish the role of ultrasound (USG) in assessment of palpable breast masses. In our study maximum number of cases with palpable masses were seen in age group age group 50-60 years (48), followed by 40-50 years (32) and 30- 40 years which consisted of 5 patients. A study conducted by Harper detected maximum cases in middle age group women [6].

We found that 70% of lesions were benign, 20% were malignant and 10% were intermediate. This is in agreement to Morris *et al*. [7]

In present study, we observed that margins of the lesions were well defined, smooth or lobulated. In order to differentiate benign masses from and malignant masses, few characteristic such as ultrasound internal echoes, posterior echoes together with the patient's clinical history should be considered. Internal echoes were homogenous, anechoic or hypoechoic. This is similar to Gordan [8].

We found that histopathology report showed that 52 lesions were benign, 20 were malignant and 13 were inconclusive. Whereas USG reported that 59 were benign and 18 were malignant. This shows the effectiveness of USG in detecting palpable breast masses. This is in agreement with Beugled CC *et al*. [9]

Following points should be taken into consideration such as breast lump characteristics, changes in size over time, change relative to menstrual cycle, duration of mass, pain or swelling, redness, fever, or discharge, diet and medications, current medications, history of hormone therapy, family history, history of breast disease, relationship to patient, relative's age at onset etc [9].

Recent studies have shown that ultrasound of the breast can successfully distinguish between benign and malignant solid nodules. Their findings suggest that follow-up of the solid but sonographically benign breast mass is a reasonable alternative to biopsy [10, 11,12].

5. Conclusion

Maximum cases were seen in older women more than 50 years of age. Ultrasonography proved to be beneficial in detecting palpable breast masses.

6. References

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