



Role of Mammo-Sonography in Palpable Breast Lesions

KEYWORDS

mammo-sonography, palpable breast lump

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ABSTRACT A Surgeon should perceive the principal proposed by Ralph Millard¹ that natural and normal configuration of the breast is ideal and beautiful. Any intervention in the breast has psychosexual, social and economical implications for the patient and her family. Diagnosis of the breast disease by a non-invasive method should always be promoted to follow this principal. A combination of mammography and sonography aims to achieve this target by increasing the accuracy of diagnosis.

Mammography is promoted as a screening study for patients having complains of breast pain or fullness. A concomitant ultrasound examination gives a better characterization of the lesion and may increase the sensitivity and specificity of the diagnostic tool.

Introduction

Digital Mammograms play a critical role in the early screening and diagnosing of breast diseases. This is because mammograms have the ability to show changes in the breast tissue prior to a patient's or a physician's ability to feel them. Newer state of the art digital mammography equipment allows physicians to view images in real time and examine the breast in greater detail, as compared with conventional film mammography.

Digital mammograms have been shown to be more accurate at detecting tumours than older analogue technology.² Two films are done on each breast – a view from the top and one from the side. The breast is compressed by a paddle to reduce movement, minimize blurring and reduce the amount of x-rays. A radiologist will read the films and prepare a report for the patient's physician and the patient will receive a letter with the results. If we need to review results, a doctor will call the patient. Women should have a screening mammogram at age 35 to provide a baseline and then every year beginning at age 40.

If a screening mammogram detects an abnormality, the patient is usually called back for a diagnostic mammogram to take additional films that magnify the area or spot in question. Patients may also have a diagnostic mammogram to monitor an abnormality seen on a prior mammogram or if they have breast implants, which need to be "pushed back" to obtain an adequate film.³ Patients experiencing symptoms such as pain, discharge from the nipple, or a lump may also need a diagnostic mammogram. The radiologist immediately reads the film, and the results are reviewed with the patient.

A breast ultrasound is usually a follow-up to a mammogram when the radiologist detects an abnormality or when a lump is felt in the breast. Approximately 5-15 percent of women are called back for additional imaging and most of the time, the findings are benign. A transducer runs over the breast area, sending and receiving sound waves to form a picture on the screen. A radiologist reviews the images and the results are discussed with the patient.⁴

AIMS AND OBJECTIVE

The aims and objectives were to evaluate the role of mammography combined with sonography in palpable breast lesions, and compare them with histopathological/ surgical findings to know whether these are compatible with the ear-

lier findings.

Methods & Material

This retrospective study was done in patients presenting with palpable breast lesions. Outdoor patients referred by clinicians were included in the study.

40 patients were subjected to mammography & Sonographic examination, in the department of radio diagnosis and the results were compared with histopathological findings.

Breast Imaging Reporting & Data System (BIRADS) was done using the following grades: ⁵

- 0- Incomplete assessment, needs additional evaluation
- 1- normal/ negative
- 2- benign (includes intra mammary nodes, ectatic ducts, simple cysts, benign solid nodules such as lipoma & hamartoma)
- 3- probably benign (complicated cysts, fibro adenoma & duct papilloma)
- 4- Suspicious lesions
- 5- malignant lesions
- 6- biopsy proven malignant lesions.

Breast Composition Categories:⁵

- 1: Almost entirely fatty
- 2: Scattered fibroglandular densities
- 3: Heterogeneously dense
- 4: Extremely dense

Using the diagnostic discriminants, breast masses are classified in various categories, as shown below.^{6,7,8,9,10}

(TABLE 1: Categories of Ultrasonographically visualized Breast Masses) to be placed here.

	Simple Cyst	Fibroadenoma	Indeterminate	Suspicious
Margins	Sharp, smooth	Sharp, smooth	Usually sharp, usually smooth, maybe indistinct	Irregular, indistinct, jagged
Echogenicity	Anechoic	Hypo-echoic	Variable anechoic, hypo-echoic	Almost anechoic, hypo-echoic

Internal Pattern	None	Homogeneous	Heterogeneous	Heterogeneous
Retro-moral phenomenon	Posterior enhancement	Posterior enhancement, bilateral edge shadowing	Posterior enhancement	Irregular Shadowing or none
Compressibility:	Yes	None	Variable	None
Lateral/anteroposterior dimension	Variable	>1cm	Variable	<1cm

OBSERVATIONS

A total of 40 patients were subjected to mammography & sonography examinations, in the department of radio diagnosis.

Age-wise distribution of the diagnosis is as per Table 3.

As shown in the charts below, the specificity of only mammography is 85%, and sensitivity is 90%. Whereas the specificity of only sonography is 90% and sensitivity is 95%. When combined, the specificity is 95% and sensitivity is 98%.

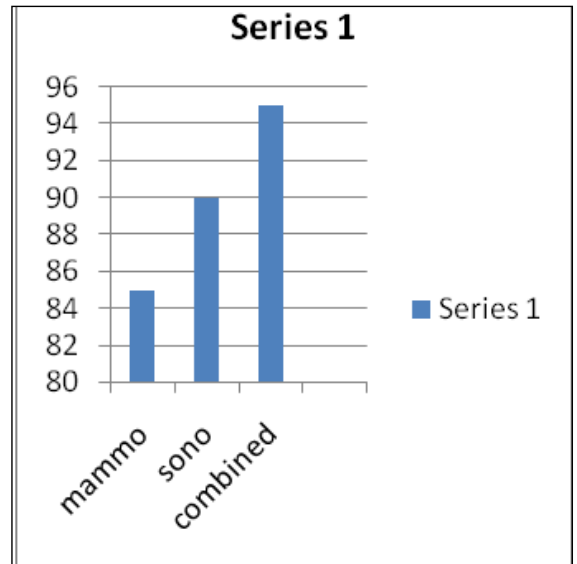
TABLE 2: Breast lumps diagnosed in study

Diagnosis	Number of cases
Fibro Adenoma	22
Malignancy	11
Fibro Cystic Breast Disease	2
Fat Necrosis	2
Phyllodes Tumor	1
Duct Papilloma	1
Galactocele	1

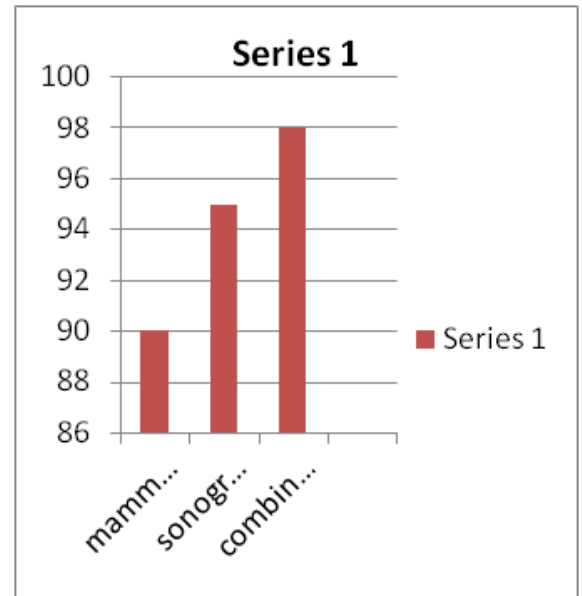
TABLE 3: AGE DISTRIBUTION

Diagnosis/ Age Group	0-19 Y	20-39 Y	40-59 Y	>59 Y
Fibro adenoma	3	15	4	-
Malignancy	-	1	4	6
Fibrocystic breast disease	-	2	-	-
Fat necrosis	-	2	-	-
Phyllodes tumor	-	1	-	-
Duct papilloma	-	1	-	-
Galactocele	-	1	-	-

CHART 1 Specificity



SENSITIVITY



DISCUSSION

Mammo-Sonographic characteristics of suspicious/malignant mass lesions that show on mammography are speculation, micro-calcification, micro-lobulations, linear-calcification, branching pattern, and asymmetrical density.

Characteristics seen in sonography are speculation, micro calcification, micro lobulations, linear calcification which maybe taller than wider, acoustic shadowing, hypo echogenicity, and thick echogenic capsule.

Breast lesions maybe divided into neoplastic and non-neoplastic lesions. The neoplastic lesions are fibro adenoma, lipoma, duct papilloma, phylloides tumor and malignancy. The non neoplastic lesions are cysts, fibro cystic breast disease, fibro adenosis, fat necrosis, duct ectasia, galactocele, abscess, and tuberculosis.

Classical fibroadenomas are elliptical in shape, surrounded by thin acrogenic capsule, wider than taller, and have fewer gentle lobulations.¹¹ A posterior acoustic enhancement is

seen. On mammo sonographic & clinical examination they are found to be mobile, often called breast mouse. A measurement of >6 cm in size is called giant fibro adenoma. Juvenile fibro adenomas occurring in adolescent girls have a tendency to grow as giant fibro adenoma.

In addition to routine investigations malignant lesions should also be evaluated for axillary lymphadenopathy & metastasis. Patients should be screened by USG abdomen, chest x-ray & according to particular complaint if any.

A rare tumor of fibro epithelial origin is the phylloid tumor, which presents as a large breast lump too often, and is usually mobile. It has a monotonous cellular stroma with branching cleft like myxoid cystic spaces imparting a sarcomatous appearance. "Cystosarcoma Phylloides" is a misnomer term, because most of these tumors are benign although a small percentage may become malignant & metastasize to the lungs and bones. On mammography, it looks like a large lobulated fibroadenoma, as seen in the picture below. On sonography, features of fibro adenoma and fluid clefts with large a mobile mass is seen, which is highly suggestive of a phylloides tumor.

Duct papilloma is a benign lesion in which proliferation of the ductal epithelium occurs and the lesion remains attached to the epithelium by means of a fibro-vascular core. Often, a duct surrounding the lesion gets dilated, giving it the appearance of an intra-cystic papilloma. It is the most common cause of serous & bloody discharge. A common location of it is the sub-areolar region. Often mammograms fail to detect the lesion. When it reaches up to a sufficient size, the sub-areolar mass with a dilated duct may be seen. Mulberry like calcifications may also be seen. On sonography, a dilated duct with a solid mass is detectable and a fibro-vascular stalk is detected on the doppler mode.

A fibro-cystic breast disease is characterized by an abundance of fibrous tissue and formation of cysts. Mammo sonography reveals dense breast parenchyma with multiple cyst formations.

In fat necrosis, there is an important history of antecedent trauma, which however, may not be acquired in all cases. Necrosed fat becomes gelatinous and encapsulated by a thin fibrous rim. On mammography, it may present as a speculated lesion with a lucent centre and a calcified rim. On sonography, a variable appearance is seen, as seen in the pictures below.

A galactocoele is a cystic lesion with inspissated milk, which is commonly encountered in a post partum female. On mammography, it is seen as a well circum-scribed lesion with a thin wall. On sonography, a hypo-echoic mass with dilated ducts around the lesion is seen.

CONCLUSION

Mammography and sonography have an almost similar sensitivity in detecting various palpable breast lesions, but the specificity of mammography increases with the use of sonography.¹² Furthermore, mammo-sonography findings correlate well with histopathological diagnosis. Benign lesions have a typical predominance under the age of 40 years, while malignant lesions have a peak after age of 40 years.

It is the decision taken by the clinician, on the remarks of the radiologist, that which patient is advised assurance, which patient should go for a USG-guided FNAC, and which patient should undergo an open biopsy.

Out of the undiagnosed segment of patients that remain after either solely mammography or solely sonography, 50% of them will be diagnosed correctly when the two modalities of investigation are combined.¹³

Therefore, our study suggests that any patient who is advised to go for a single modality of investigation should rather be investigated using the combined modality.

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