ORIGINAL RESEARCH PAPER

Surgery

A STUDY OF DIAGNOSTIC ACCURACY IN BENIGN BREAST DISEASE WITH SPECIAL REFERENCE TO RECENT DIAGNOSTIC TOOLS

KEY WORDS:

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ABSTRACT

BACKGROUND Benign breast disease is a common disorder. It is atleast 10 times more common than breast cancer in hospital clinics (1). The histological changes of benign breast disease are in reality part of the spectrum of changes that occur in the life time of breast tissue. These histological charges do not proceed as a smooth continuum; the individual elements often occur simultaneously and can give rise to anatomical (palpable) abnormalities such as nodularity (or) cystic change, which may initiate referral to hospital, but are not disease in the true sense of word. However an increasing interest in histology of the normal human breast with studies of autopsy and biopsy material, is providing a background which allowed a better understanding of what is normal and what is abnormal, thus helping to correct the tendency to overrate the malignant potential of benign Breast disease. **AIM OF THE STUDY** To compare the utility of mammography and sonography in the diagnosis of benign breast diseases. To study the utility of 3D Ultrasound in the evaluation of Benign Breast lesions. **MATERIAL AND METHODS** The term benign breast disease encompasses a wide range of clinical and pathological entities. Up to 30% of women may suffer from a benign breast disorder requiring treatment at sometime in their life. In general population on examination of breast grossly evident cystic changes were found in 20% but histological evidence of cystic changes were found in 59% of women(2). In patients attending breast clinic for various breast problems, 40% of patients were found to be having fibrocystic changes and about 7% having fibroadenoma. Hence benign breast disease requires imaging studies for evaluations. Mammography and ultrasound are the most useful tools for this purpose. Mammography is used as a primary tool in benign breast disease and also as a screening tool to detect early breast cancer. **RESULTS** Ultrasound is used to differentiate cystic lesions from solid lesions and particularly useful in dense breast seen in young women. Both of these tools are also useful in localizing to lesion and in guiding biopsy. **CONCLUSION** Hence both ultrasound and Mammography are the pillars on which the edifice of this study is built.

INTRODUCTION

ANATOMY OF THE BREAST

The breasts consist of mammary and associated skin and connective tissues. The mammary glands are modified sweat glands which consist of a series of ducts and associated secretory lobules. These converge to form 15 to 20 lactiferous ducts, opening independently on to the nipple. The nipple is surrounded by a circular pigmented area of skin termed the areola.

A well developed connective tissue stroma surrounds the ducts and lobules of the mammary gland. In certain regions, these condense to form well defined ligaments (the suspensory ligaments of Astley cooper) which are continuous with the dermis of the skin and support the breast. In non-lactating women the predominant component of the breast is fat, while glandular tissue is more abundant in lactating women. The breast lies on deep fascia related to the pectoralis major muscle and other surrounding muscles.

A layer of the loose connective tissue (the retro mammary space) separates the breast from the deep fascia and provides some degree of movement over underlying structures. The base (or) attached surface of each breast extends vertically from Ribs II to VI and transversely from the sternum to as far laterally as the mid axillary line. A small extension called the axillary tail of Spence pierces the deep fascia and lies in the axilla. Breast in the male is rudimentary and consists only of small ducts often composed of cords of cells that normally do not extend beyond the areola.

DEVELOPMENT OF BREAST

The first indication of mammary glands is found in the form of a band like thickening of the epidermis as the mammary line (or) mammary ridge (3). In a seven week embryo this line extends on each side of the body from the base of the forelimb to the region of the hind limb. Although the major part of the mammary line disappears shortly after it forms, a small portion in the thoracic region persists and penetrates the underlying mesenchyme. Here it forms 16 to 24 sprouts, which in turn give rise to small solid buds. By the end of prenatal life the epithelial sprouts are canalized and form to lactiferous ducts and the buds form small ducts and alveoli of the gland.

Initially the lactiferous ducts open in to small epithelial pit. Shortly after birth this pit is transformed in to the nipple by proliferation of the underlying mesenchyme.

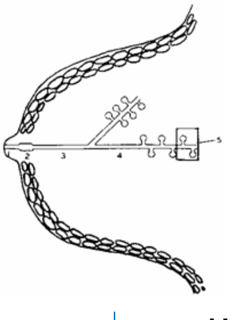


Figure shows the Anatomy of the duct system of the breast.
1. Collecting duct 2. Lactiferous sinus. 3. Segmental duct. 4. Subsegmental duct. 5. Terminal duct lobular units (TDLU) arising from subsegmental duct. (Recent advances 11 – Taylor)(4)

BREAST IMAGING

Mammography has proved to be the single most important technique for symptomatic and asymptomatic women. Symptomatic women with a known palpable mass or a suspicious area of the breast require diagnostic problem solving mammography. The first dedicated mammography machine was developed in 1966. Until this time, mammographic images had been produced by simply using a Conventional Radiography machine. In 1967, a research team designed a basic unit, incorporating a more specific X-ray spectrum and tube to better focus on the breast tissue and chest cavity. Through a dedicated design and the implementation of molybdenum, a strong metal component, this machine (a tube and a lens on a three- legged stand) produced better quality images than make-shift mammograms from a conventional radiography equipment of that era. The first commercial model of the "Senographe" (French for "picture of the breast") as it was called, became available in 1967. In the early 80's, the first motorized compression device was born. Today women can expect state-of-the-art results from machines that use Rhodium, a metal element inthe X-ray tube that enables better penetration of the breast tissue with less radiation exposure to the patient. Rhodium technology is especially helpful for women with dense breasts (up to one third of the female population) who were not benefiting from mammography before Rhodium was applied to breast imaging equipment.

Rhodium

Name: rhodium Symbol: Rh
Atomic number: 45 Atomic weight: 102.90550 (2)
Group number: 9 Group name: Precious metal or Platinum group metal Period number: 5 Block: d-block

The use of rhodium filtration over others in thick breasts is because of the lower administered dose and of shorter exposure time with direct magnification . (Radiol Med (Torino). 1994 Sep;88(3):295-300.) (7).

Remarkably ultrasound of the breast has been performed both in vitro and clinically for 53 years. The first clinical application of breast ultrasound was reported in 1954 by Wild and Reid. The focus was however clearly on the goal of distinguishing benign and malignant lesions and the results were remarkably accurate in this regard. A major improvement occurred in 1969 with the introduction of grey scale imaging. In the late 1960's Kelly-fry et al (USA) attempted characterization of known masses with an effort toward early detection of sub clinical lesions. Theirs was the first attempt to identify the different structural elements of the mammary gland.

THREE DIMENSIONAL ULTRASOUND OF BREAST MASS

In patients with benign cystic masses the pericystic breast parenchyma is compressed and pushed and hence shows a compressive pattern, however the margins are smooth (8).

In patients with duct ectasia 3D ultrasound helps us by giving a cube of volume. When the cube is sliced through the region of interest and rotated the ducts will be seen coursing from the nipple to the deeper tissues.

In the case of fibroadenomas 3 D ultrasound is useful in seeing the margins of the lesion. Measurements are best taken in the coronal view as this gives the widest measurement.

Malignant lesions have the characteristic 'Retraction pattern' surrounding the lesion due to traction on the surrounding tissues by the intense desmoplastic reaction and infiltration. 3D vascular reconstructions can sometimes aid in the diagnosis of malignancy by showing a distorted vascular branching pattern.

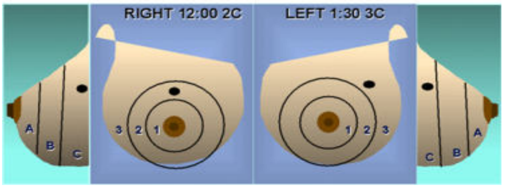
LOCALISATION OF LESION

Lesions on mammography are localized as medial or lateral with respect to its location on the cephalo-caudal view and superior or inferior with respect to the lateral or medio-lateral oblique view. It is then assigned to that particular quadrant of the breast as in supero-lateral, infero-lateral, supero-medial or infero-medial.

Lesions on sonography are localized with respect to their clock position, plane of the lesion and distance from the nipple. They are marked as 1, 2 or 3 depending on their proximity to the nipple with lesions within the circumference of 1 being closer to the nipple. Lesions are marked as A, B or C depending on the plane of the lesion,

(A) being in the skin or subcutaneous plane, B) in the mammary layer and C) in the retro mammary layer. For example, a lesion at 12 2 C is at 12 o clock position mid-way from the nipple and in the retro-mammary layer.

LOCATION IDENTIFICATION



SONOGRAPHIC LOCATION OF A MAMMOGRAPHIC LESION

Lesions which are lateral on the CC view will lie lower in the breast than suggested by its location on the MLO view. Lesions which are medial will be located more superiorly than suggested by the MLO projection. Mammograms are performed inonly 2 or 3 projections with the breast pulled away from the chest wall while sonography is generally performed with the patient supine and the gland flattened against the chest wall. Therefore the distance of the lesion from the chest wall cannot be estimated correctly. Lesions deep within the breast tissue on the mammogram may be superficial on sonography.

BREAST IMAGING- REPORTING AND DATA SYSTEMS (BI-RADS) LEXICON FOR BREAST LESIONS

MASS	A "Mass" is a space occupying lesion seen in two different projections. If a potential mass is seen in only a single projection it should be called a "Density" until its three- dimensionality is confirmed. Circumscribed (well-defined or sharply-defined) margins: The margins are sharply demarcated with an abrupt transition between the lesion and the surrounding tissue. Without additional modifiers there is nothing to suggest infiltration. Indistinct (ill defined) margins: The poor definition of the margins raises concern that there may be infiltration by the lesion and this is not likely due to superimposed normal breast tissue. Spiculated Margins: The lesion is characterized by lines radiating from the margins of a mass.

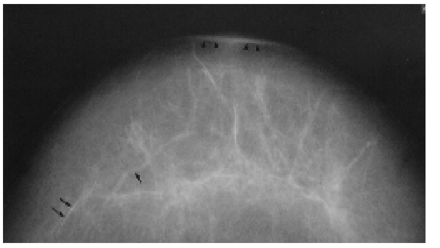
ARCHITECTURAL DISTORTION	The normal architecture is distorted with no definite mass visible. This includes spiculations radiating from a point, and focal retraction or distortion of the edge of the parenchyma. Architectural distortion can also be an associated finding.
ASYMMETRIC DENSITY	This is a density that cannot be accurately described using the other shapes. It is visible as asymmetry of tissue density with similar shape on two views, but completely lacking borders and the conspicuity of a true mass. It could represent an island of normal breast, but its lack of specific benign characteristics may warrant further evaluation. Additional imaging may reveal a true mass or significant architectural distortion.

ASSESSMENT CATEGORIES

Category 1 / Negative	There is nothing to comment on. The breasts are symmetrical and no masses, architectural disturbances or suspicious calcifications present
Category 2 / Benign Finding	This is also a negative mammogram, but the interpreter may wish to describe a finding. Involuting, calcified fibroadenomas, multiple secretory calcifications, fat containing lesions such as oil cysts, lipomas, galactoceles, and mixed density hamartomas all have characteristic appearances, and may be labeled with confidence. The interpreter might wish to describe intramammary lymph nodes, implants, etc. while still concluding that there is no mammographic evidence of malignancy.
Category 3 / Probably Benign Finding - Short Interval Follow-Up	A finding placed in this category should have a very high probability of being benign. It is not expected to change over the follow-up interval, but the radiologist would prefer to
Suggested	establish its stability. Follow – up is done at 6 month intervals U/L and 1 year interval B/L for 2-3 years.
Category 4 / Suspicious Abnormality - Biopsy Should Be Considered	These are lesions that do not have the characteristic morphologies of breast cancer but have a definite probability of being malignant. The radiologist has sufficient concern to urge a biopsy. If possible, the relevant probabilities should be cited so that the patient and her physician can make the decision on the ultimate course of
Category 5 / Highly Suggestive of Malignancy	These lesions have a high probability of being cancer. Appropriate Action Should Be Taken

MAMMOGRAPHIC APPEARANCE OF NORMAL BREAST

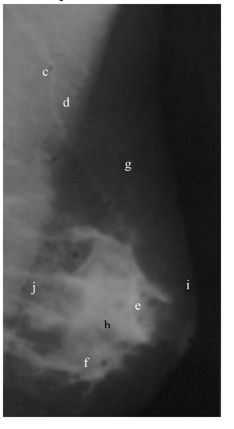
Young women's breasts contain large proportion of glandular tissue which appears as soft tissue density on mammogram .In older women, when involution of glandular tissue has occurred most of the breast has fatty density. The junction between the subcutaneous and retro-mammary fat layers with the glandular tissue should consist of a series of curved margins. Other normal structures visible on the mammogram include nipple, skin, blood vessels, ducts, Cooper's ligaments and axillary lymph nodes (refer fig-2).



CRANIO-CAUDAL VIEW OF THE BREAST

1. Single arrow denotes vessel;
2. Double arrow denotes ligament of cooper
3. Arrow heads denote skin

MEDIOLATERAL OBLIQUE VIEW OF THE BREAST

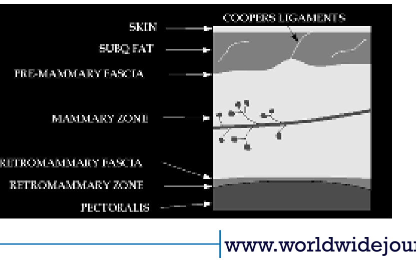


a- nipple; b- areola; c- pectoralis muscle;
d- vessel; e- duct; f- coopers ligament;
g- fat; h- glandular tissue; i- skin fold;
j- retro-mammary tissue.

ULTRASONOGRAPHIC ANATOMY

On ultrasound, breast is a multilayered structure. The skin and fibro glandular plate are relatively echogenic while the subcutaneous and retromammary fat layers are echopoor. Normal skin thickness measures around 0.5-2 mm except at the inframammary crease, cleavage and periareolar region where it is thicker. The subcutaneous fat layer is separated from glandular tissue by a well defined scalloped margin. The chest wall muscles are also echopoor in young patients but become moreechogenic with fatty infiltration of age. Ultrasound appearance of breast tissue depends on how much involution of glandular tissue has taken place. Young glandular breast contains a well defined layer of glandular tissue within which round or oval well defined echo poor fat lobules may be present. As involution takes place, the breast tissue shows fat lobules separated by fine curvilinear septa of increased echogenicity. Normal ducts are often visible particularly in the subareolar region as anechoic tubular structures.

SONOGRAPHIC ANATOMY OF THE BREAST



BENIGN DISEASES OF THE BREAST

CLASSIFICATION OF BENING BREAST DISORDERS

Non – Proliferative disorders of the breast

- Cysts and apocrine metaplasia
- Duct ectasia
- Calcification
- Fibro adenoma and related lesions

Proliferative disorders without atypia

- Sclerosing adenosis
- Radial and complex sclerosing lesion
- Ductal epithelial hyperplasia
- Intraductal papillomas

Atypical proliferative lesions

- Atypical lobular hyperplasia
- Atypical ductal hyperplasia

Relative Risk of invasive breast cancer (Recent Advances 21 I. Taylor) (1)

No Increased risk

Adenosis – sclerosing or florid
Hyperplasia (mild 2-4 epithelia cells in depth)
Apocrine metaplasia
Cysts – macro and / or micro
Duct ectasia and periductal mastitis
Mastitis (inflammation) Fibroadenoma
Squamous metaplasia FibrosisSlightly increased risk (1.5-2 times)
Hyperplasia, moderate or florid, solid or papillary Papilloma with fibrovascular core
Moderately increased risk (5 times) A typical hyperplasia
Ductal Lobular Lobular
Insufficient data to assign a risk
Solitary papilloma of lactiferous duct Radial scar lesion

NOMENCLATURE

The basic principles underlying the aberration of normal development and involvement (ANDI) classification of benign breast conditions are 1) Benign breast disorders and diseases are related to the normal processes of reproductive life and to involution 2) There is a spectrum of breast condition that ranges from normal to disorder to disease; and 3) the ANDI classification encompasses all aspects of the breast condition, including pathogenesis and the degree of abnormality (6). The horizontal component of the following table defines ANDI along a spectrum from normal, to mild abnormality (disorder), to severe abnormality (disease). The vertical component defines the period during which the condition develops (6).

	Normal	Disorder	Diseases
Early reproductive years age (15-25)	Lobular development Stromal Development	Fibroadenoma Adolescent hypertrophy	Giant Fibroadenoma Gigantomastia
	Nipple eversion	Nipple inversion	Subareolar abscess Mammary duct fistula
Later reproductive years (age 25-40)	Cyclical changes of menstruation	Cyclical mastalgia Nodularity	Incapacitating mastalgia
	Epithelial hyperplasia of pregnancy	Bloody nipple discharge	
Involution (age 35-55)	Lobular involution Duct involution Dilatation Scelerosis Epithelial turnover	Macrocysts Sclerosing lesions	
		Duct ectasia Nipple retraction	Periductal mastitis
		Epithelial hyperplasia	Epithelial hyperplasia with atypia

AIM OF THE STUDY

- To compare the utility of mammography and sonography in the diagnosis of benign breast diseases.
- To study the utility of 3D Ultrasound in the evaluation of Benign Breast lesions.

MATERIALS AND METHODS

Female patients in the pre, peri and post menopausal age groups with benign breast disorders who underwent breast ultrasound and mammography from September 2003 were included in this study. Patients with features of malignancy were excluded from the study. Standard nomenclature for characterization of the lesions on mammography and ultrasound were used. Subsequently all the patients underwent histopathological examinations of lesions in the form of excision biopsy or true cut biopsy.

Patients in whom histopathology could not be done due to practical reasons Fine Needle Aspiration Cytology was done. In correlation with the clinical diagnosis and FNAC final diagnosis was arrived and patients were treated accordingly.

Methods:

Cranio-caudal and Medio-Lateral Oblique views of mammographs of both breasts were taken –24-30 KV; 100mAs. Ultrasound examination was done with high frequency linear transducer of both breasts.

3D volume probe was used to acquire coronal plane which was simply used to classify the margins of the lesion into three types of patterns- Retraction, Compression and Indeterminate.

We have compared the sensitivity USG with the mammography using Z test. P value less than 0.05 was considered as statistically significant. HPE was considered as gold standard. Where HPE is not done due to practical reasons, Fine Needle Aspiration Cytology was considered as gold standard. Statistically analysis were done using SPSS 11.5 version. (Statistical Package for Social Sciences)

OBSERVATION AND RESULTS

Sixty nine patients were included in this study. All patients underwent ultrasound of the breast and mammography. All the 69 patients underwent FNAC. Histopathological examinations were done for 49 patients.

In Our study out of 69 patients histopathological confirmation was possible in 49 patients. Of the remaining patients, 10 patients were not willing for surgery because of the small size of the lesions and for cosmetic objections and another 10 patients did not require biopsy and were conservatively treated. Out of the 49 patients in whom histopathological confirmation and FNAC were done, result of the FNAC did not correlate with the HPE in 5 patients. Because of difficulty in finding out location of the lesion in 3 patients FNAC was negative. In 2 cases of phylloids tumour FNAC was unable to diagnose correctly. All other cases FNAC was consistent with histopathological examination.

Out of the 49 patients Ultrasound showed positive diagnosis for 46 patients with a sensitivity of 93.9%. Whereas mammography was positive was only in 33 patients with a sensitivity of 67.3%. Statistical test of proportion showed that Z value is 3.3 with the corresponding p value less than 0.001. Hence it is concluded that ultrasound produces statistically significant higher sensitivity compared to mammography. We compared sensitivity of ultrasound and mammography keeping gold standard as histopathological examination. It is found that ultrasound in general shows the sensitivity of 92.8% (positive results for 64 patients out of 69 examined), whereas mammography showed the sensitivity of 66.7% (Positive results for 46 out of 69 patients examined). This difference is statistically significant because the z value is 3.8. Hence the corresponding p value is less than 0.001.

TABLE 1 AGE GROUP WISE DISTRIBUTION OF BENIGN BREAST DISEASES

AGE GROUP (YRS)	NO. OF PATIENTS	%
< 20	15	21.74
21- 30	26	37.68
31- 40	21	30.43
> 41	7	10.14

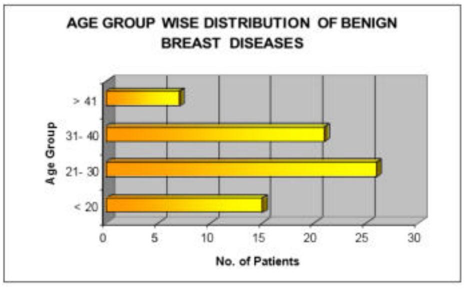


TABLE 2 ULTRASOUND AND MAMMOGRAPHIC COMPARISION

Mammography	Ultrasound
46	64

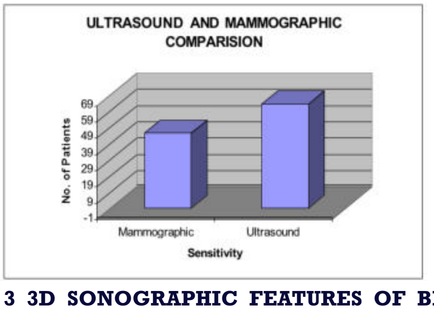


TABLE 3 3D SONOGRAPHIC FEATURES OF BENIGN LESIONS

CORONAL PLANE	NO. OF LESIONS (N=64)	% OF LESIONS
RETRACTION	1	1.56
COMPRESSION	58	90.63
INDETERMINATE	5	7.81

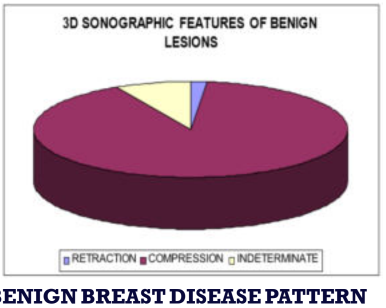


TABLE 4 BENIGN BREAST DISEASE PATTERN

Name of the Disease	No. of Patients (n=69)	%
Fibroadenoma	50	72.46
Fibrocystic Disease	10	14.49
Breast Abscess	5	7.25
Fibroadenosis	2	2.90
Phylloides tumour	2	2.90

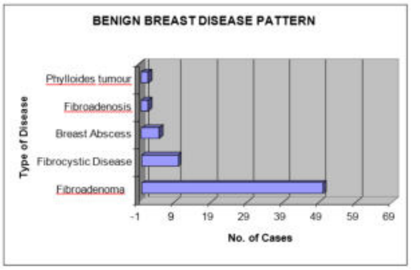
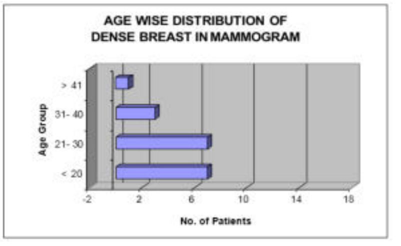


TABLE 5 MAMMOGRAPHICALLY DENSE BREAST AGE WISE DISTRIBUTION

AGE GROUP	Dense Breast
< 20	7
21- 30	7
31- 40	3
> 41	1



DISCUSSION

The role of mammography in patients with benign breast diseases is to delineate the lesion with its shape and location. Mammography is also helpful to rule out malignant features in the involved breast and also to screen the opposite breast.

In our study of 69 patients mammography was useful in detecting 46 of the lesions with the sensitivity of 66.7%. 18 patients had mammographically dense breast hence lesions could not be made out. In another 5 patients mammography was unable to give the features of specific diagnosis.

Linda Moy et al (32), in their study of 829 patients, have concluded that mammography failed to detect lesions in patients with dense breasts. In our series of 69 patients mammography failed to detect lesions in 23 patients as 18 out of these 23 patients had mammographically dense breast.

Bennet C et al (25) and Lawrence W Bassett (15) have documented the decreased sensitivity of mammography in dense breast mostly in young women. In our study of 69 patients 18 patients had mammographically dense breast, of whom 14 were less than 30 years of age.

According to Thomas M Kolb et al (26) who have studied 11130 women, have documented that sensitivity of mammography to detect lesions was 77.6%. Mammographic sensitivity for breast lesions declines significantly with increasing breast density. Addition of screening US significantly increases detection of small lesions and depicts significantly more lesions and at smaller size and lower stage than doesphysical examination. In their study sensitivity of mammography was 78%. Addition of screening US to screening mammography increased the sensitivity to 97%.

In our study, ultrasound of breast was done in all the 69 patients, ultrasound breast was able to pickup the diagnosis correctly in 64 patients with the sensitivity of 92.8% USG breast was particularly more useful in women with dense breast where mammography had limited sensitivity. USG was also helpful in the characterization of the lesions and was helpful in differentiation of cystic from solid masses. Of the 5 patients whom USG breast failed to characterize the specific lesions, 3 had fibrocystic disease and two had fibroadenosis. Ultrasound has limited sensitivity in small lesions of less than

1 cm which may be the cause for its inability to detect small lesions in these patients.

Additional imaging with sonography is appropriate in most instances except in lesions that are mammographically benign. Sonography may obviate the need for intervention by showing benign causes for palpable abnormalities such as cysts.

In their study of 103 patients Jacqueline S Kaiser et al (24) have found that sensivity of mammography was 60% and sensivity of ultrasound was 100% in detecting the lesion showing superiority of ultrasound over mammography. In our series of 69 patients sensitivity of ultrasound (92.8%) was superior to mammography (66.7%).

Logan Young et al have stated in their study (20) that ultrasound with high frequency transducer is essential for accurate non invasive diagnosis of breast cysts and has showed promise in the differentiation of benign from malignant solid masses.

Mahesh K Shetty et al (13) in their study of 398 patients have also stated that Sonography is complementary to mammography in patients with palpableabnormalities, its superiority over mammography is in being able to show lesions obscured by dense breast tissue and in characterizing palpable lesions that are mamographically visible or occult. Mammography is complementary to sonography because of its ability to screen the remainder of the ipsilateral and contralateral breast for clinically occult lesions. It has been reported that the accuracy of sonography is comparable with that of mammography as a screening modality for breast lesion.

In their study of 1517 women Pavel Crystal et al(28) have found that breast screening with sonography in the population of women with dense breast tissue is useful in detecting lesions not seen in mammography.

Isabelle le conte et al,(37) in their study of 4236 ptients, have found that sonograpy is an useful adjunct after mammography for the detection of lesions particularly in the dense breast. In their study sensitivity of ultrasound was 88% and that of mammography was 56%.

In one of our patients, extension of the cystic lesion into the pleural cavity was detected only on ultrasound and helped us to come to a diagnosis of tuberculous abscess.

Current surgical therapy by John. L.Cameron says that Addition of screening sonography to screening mammography could increase by 42% the number of nonpalpable lesions diagnosed. The benefits were greatest in women with dense breasts, as mammograms have the lowest sensitivity in this population (39).

3D ultrasound was helpful in additionally characterizing most of the lesions. Compressive pattern was seen in 3D ultrasound almost all benign lesions (58 out of 64 benign lesions) and in one patient retraction pattern was seen and further investigationdelineated atypical cells suspicious for malignancy. Five Patients showed indeterminate pattern on 3D ultrasound with subsequent diagnosis of breast abscess in 4 patients and in one patient with a benign lesion, which on further investigation delineated fibrocystic disease. In these 5 patients 3D ultrasound did not provide any better information than was available with 2D ultrasound. Hence 3D ultrasound was not helpful in lesions causing lesser degrees of architectural distortions. (Lesions which had irregular or lobulated margins on 2D ultrasound could not be grouped into either of these patterns where therefore indeterminate for benign or malignant lesions on 3D ultrasound).

Rotten D et al (34, 35) also found in their study of the usefulness of 3D ultrasound in breast diseases and these 2 patterns of compression & retraction were preferentially associated with benign and malignant lesions respectively. Three dimensional ultrasound mammography had a higher specificity but lower sensitivity than two dimensional mammography in their study.

In Our study, out of 69 patients histopathological confirmation was possible in 49 patients. Of the remaining patients, 10 patients were not willing for surgery because of the small size of the lesions and for cosmetic objections and another 10 patients did not require biopsy and were conservatively treated. Out of the 49 patients in whom histopathological confirmation and FNAC were done, result of the FNAC did not correlate with the HPE in 5 patients because of difficulty in finding out location of the lesion in 3 patients and in 2 cases phylloids tumour FNAC was unable to diagnose. All other cases FNAC was consistent with histopathological examination.

CONCLUSION

MAMMOGRAPHY IS SUPERIOR TO ULTRASOUND IN THE DETECTION OF MICROCALCIFICATION.

SONOGRAPHY IS COMPLEMENTARY TO MAMMOGRAPHY IN PATIENTS WITH PALPABLE ABNORMALITIES OF THE BREAST.

SONOGRAPHY'S SUPERIORITY OVER MAMMOGRAPHY IS IN IT'S ABILITY TO SHOW THE PRESENCE AND EXTENT OF LESIONS THAT ARE OBSCURED BY DENSE BREAST TISSUE AND IN CHARACTERISING PALPABLE LESIONS THAT ARE MAMMOGRAPHICALLY NOT VISIBLE OR OCCULT.

ULTRASONOGRAM IS MOST HELPFUL IN CHARACTERISING CYSTIC LESIONS AND STUDYING THE INTERNAL COMPONENT OF THESE LESIONS.

THREE DIMENSIONAL ULTRASOUND IS HELPFUL IN ADDITIONALLY CHARACTERISING MOST OF THE LESIONS THAT CAUSE GREATER DEGREES OF ARCHITECTURAL DISTORTION.

COMPRESSION PATTERN PROVES TO BE MORE SPECIFIC FOR BENIGN LESIONS.

THREE DIMENSIONAL ULTRASOUND IS NOT VERY SPECIFIC FOR LESIONS CAUSING LESSER DEGREES OF ARCHITECTURAL DISTORTION.

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