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CERTIFICATE

Certified that this is the bonafide dissertation done by

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and

submitted in partial fulfillment of the requirements for the

Degree of M.S., General Surgery, Branch I of

The Tamilnadu Dr. M.G.R. Medical University, Chennai

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DECLARATION

I solemnly declare that the dissertation titled **"A Study of Diagnostic Accuracy in Benign Breast Disease with Special reference to Recent Diagnostic Tools**" was done by me from September 2003 onwards under the guidance and supervision of **Professor Dr. R. PERUMAL RAJAN M.S.**

This dissertation is submitted to the Tamilnadu Dr. MGR Medical University towards the partial fulfillment of the requirement for the award of MS Degree in General Surgery (Branch I).

Place : **Dr. V. CHANDRAMOHAN**

Date :

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CONTENTS

INTRODUCTION

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.

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.

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.

Hence both ultrasound and Mammography are the pillars on which the edifice of this study is built.

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.

REVIEW OF LITERATURE

DEVELOPMENT OF THE 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.

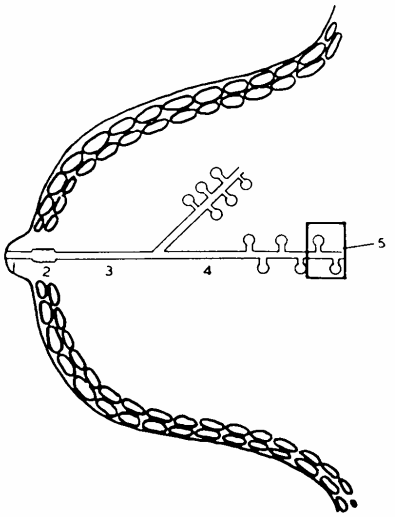
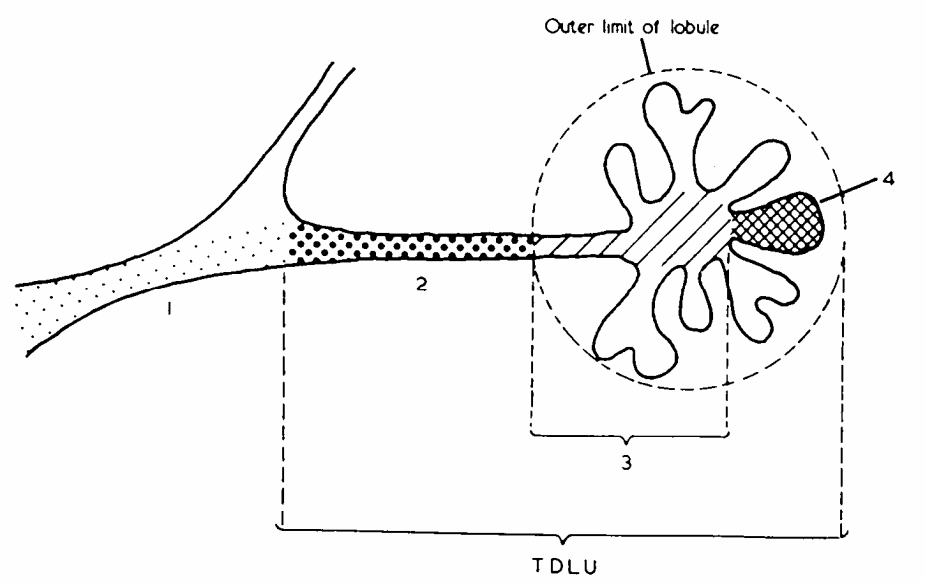


Figure shows the Anatomy of the duct system of the breast.
1. Collecting duct 2. Lactiferous sinus. 3. Segmental duct. 4. Subsegmental duct. 5. Terminal duct lobular units (TDLU) arising from subsegmental duct.
(Recent advances 11 – Taylor)(4)



The TDLU

1. Subsegmental duct. 2. Extralobular terminal duct.
3. Intra lobular terminal duct. 4. Ductule

(Recent advances 11 – Taylor)(4)

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.

BLOOD SUPPLY OF THE BREAST (5):

This is derived from

1. The lateral thoracic artery, from the 2^{nd} part of the axillary artery.
2. The perforating cutaneous branches of the internal mammary artery to the 2^{nd}, 3^{rd} and 4^{th} spaces.
3. The lateral branches of the 2^{nd}, 3^{rd} and 4^{th} intercostal arteries.

VENOUS DRAINAGE

The superficial veins radiate from the breast and are characterized by their proximity to the skin. They are accompanied by lymphatics and drain to axillary internal mammary and intercostals vessels.

LYMPHATIC DRAINAGE (6):

The surgeons customarily describe 6 groups of nodes in relation to the axillary vein: 1) Axillary vein group (lateral) that consists of 4-6 lymph nodes, which lie medial or

posterior to the vein and receive most of the lymph drainage from the upper extremity. 2) External mammary group (anterior or pectoral group) that consists of 5-6 lymph nodes which lie along the lower border of the pectoralis minor muscle contiguous with the lateral thoracic vessels and receive most of the lymph drainage from the lateral aspect of the breast; 3) the scapular group (posterior or subscapular) that consists of 5 to 7 lymph nodes, which lie along the posterior wall of the axilla at the lateral border of the scapula contiguous with the subscapular vessels and receive lymph drainage principally from the lower posterior neck, the posterior trunk, and the posterior shoulder; 4) the central group that consists of 3 or 4 sets of lymph nodes, which are embedded in the fat of the axilla lying immediately posterior to the pectoralis minor muscle and receive lymph drainage both from the axillary vein, extern, mammary, and scapular groups of lymph nodes and directly fro the breast; 5) the subclavicular group (apical) that consists of 6 12 sets of lymph nodes, which lie posterior and superior to the upper border of the pectoralis minor muscle and receive lymph drainage from all of the other groups of axillary lymph nodes; and 6) the interpectoral group (Rotter's) that consists of 1 to 4 lymph node which are interposed between the pectoralis major and pectoralis minor muscles and receive lymph drainage directly from the breast. The lymph fluid that passes through the interpectoral group of lymph nodes passes directly into the central and subclavicular groups.

As indicated in Figure, the lymph node groups are assigned levels according to their relationship to the pectoralis minor muscle. Lymph nodes located lateral to or below the lower border o the pectoralis minor muscle are referred to as level I lymph nodes; which include the axillary vein, external mammary, and scapular groups. Lymph nodes located superficial or deep to the pectoralis minor muscle are referred to as level II lymph nodes, which include the central and interpectoral groups. Lymph nodes located medial to or above the upper border of the pectoralis minor muscle are referred to as level III lymph nodes, which consist of the subclavicular group.

The plexus of lymph vessels in the breast arises in the interlobular connective tissue and in the walls of the lactiferous duct and communicates with the subareolar plexus of lymph vessels. Efferent lymph vessels from the breast pass around the lateral edge of the pectoralis major muscle and pierce the clavipectoral fascia ending in the external mammary (anterior, pectoral) group of lymph nodes. Some lymph vessels may travel directly to the subscapular (posterior, scapular) group of lymph nodes. From the upper part the breast, a few lymph vessels pass directly to the subclavicular (apical) group of lymph nodes. The axillary lymph nodes usually receive more than 75% of the lymph drainage from the breast. The rest is derived primarily from the medial aspect of the breast, flows through the lymph vessels that accompany the perforating branch of the internal mammary artery, and enters the parasternal (internal mammary) group of lymph nodes.

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 in

the 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.

The early 1980's brought digital technology to the field of ultrasound in general, and breast ultrasound in particular. Later, in the early 1990's digital beam formers and broad band width capabilities led to developments such as tissue harmonics and real time spatial compounding. More recently, the use of color Doppler and power Doppler analysis of the blood supply to breast tumors has clearly increased the specificity of

clinical breast ultrasound but still falls short of the goal of 100% specificity in differentiating benign and malignant entities.

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.

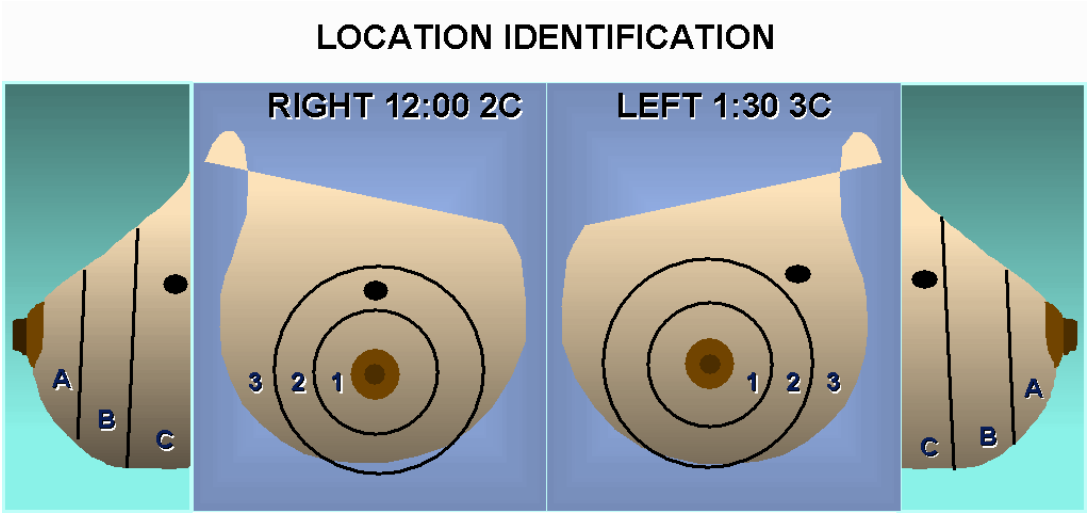
In the case of fibroadenomas 3 D ultrasound is useful in seeing the margins of the lesion. Measurements are best taken in the coronal view as this gives the widest measurement.

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.



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 in

only 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.

CALCIFICATION	**Amorphous or Indistinct Calcifications**: These are often round or "flake" shaped calcifications that are sufficiently small or hazy in appearance that a more specific morphologic classification cannot be determined. **Pleomorphic or Heterogeneous Calcifications**: These are usually more conspicuous than the amorphic forms and are neither typically benign nor typically malignant irregular calcifications with varying sizes and shapes that are usually less than 0.5 mm in diameter. **Fine, Linear or Fine, Linear, Branching (Casting) Calcifications**: These are thin, irregular calcifications that appear linear, but are discontinuous and under 0.5 mm in width. Their appearance suggests filling of the lumen of a duct involved irregularly by breast cancer. **Benign Calcifications**: Benign calcifications are usually larger than calcifications associated with malignancy. They are usually coarser, often round with smooth margins and are much more easily seen.

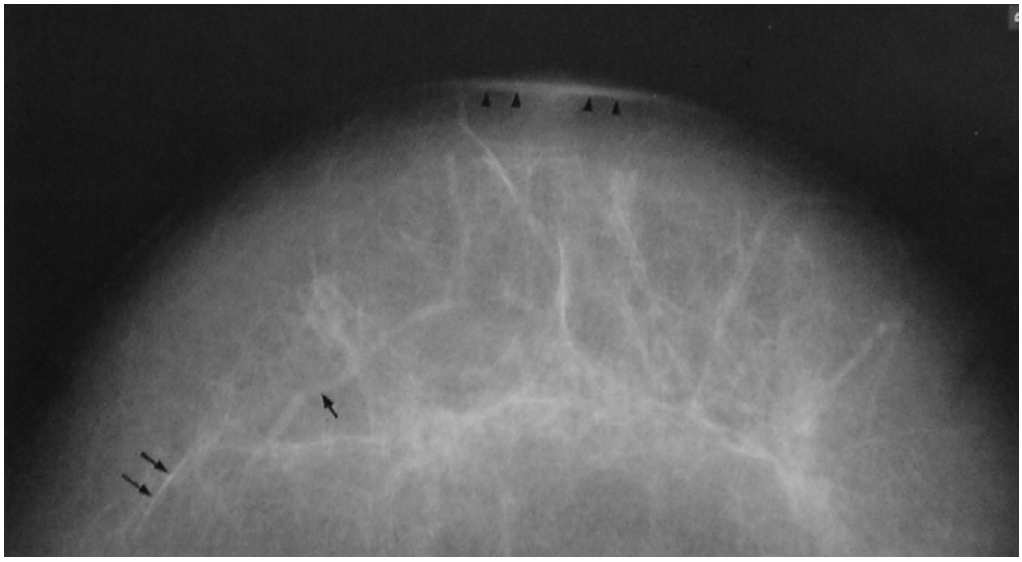
ASSESSMENT CATEGORIES

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 action.
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

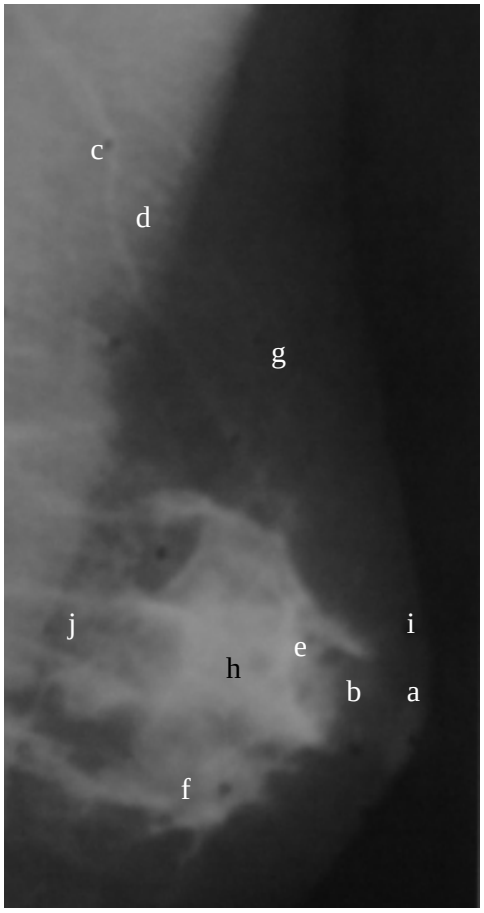
Young women's breasts contain large proportion of glandular tissue which appears as soft tissue density on mammogram .In older women, when involution of glandular tissue has occurred most of the breast has fatty density. The junction between the subcutaneous and retro-mammary fat layers with the glandular 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.

BREAST PARENCHYMAL PATTERNS:

Breast density can be graded according to the following BI-RADS density categories:

CATEGORY 1 **:** Breast composed entirely of fat.

CATEGORY 2 **:** Breast composed of scattered fibroglandular densities that could obscure a lesion.

CATEGORY 3 **:** Breast tissue is heterogeneously dense which may reduce the sensitivity of mammography.

CATEGORY 4 **:** Extremely dense breast which lowers the sensitivity of mammography.

Wolfe has described 4 parenchymal patterns of the breast based on the relative amounts of fat, epithelial and connective tissue densities as seen mammographically.

N1 : Normal. The breast parenchyma is of low density and has a large proportion of fat. No ducts are visible.

P1: Parenchyma is composed chiefly of fat with a prominent duct pattern in the anterior portion of the breast but involving less than quarter of breast volume.

P2: Prominent duct pattern which involves more than quarter of breast volume and with which there is often an associated nodular component.

DY: Increased density of breast parenchyma with or without areas of nodularity. The density often obscures the underlying duct pattern.

P2 and DY patterns have an increased risk of breast cancer as reported by Wolfe. But more recent studies have failed to confirm this association. Mammographic sensitivity decreases with increasing density of breast parenchyma.

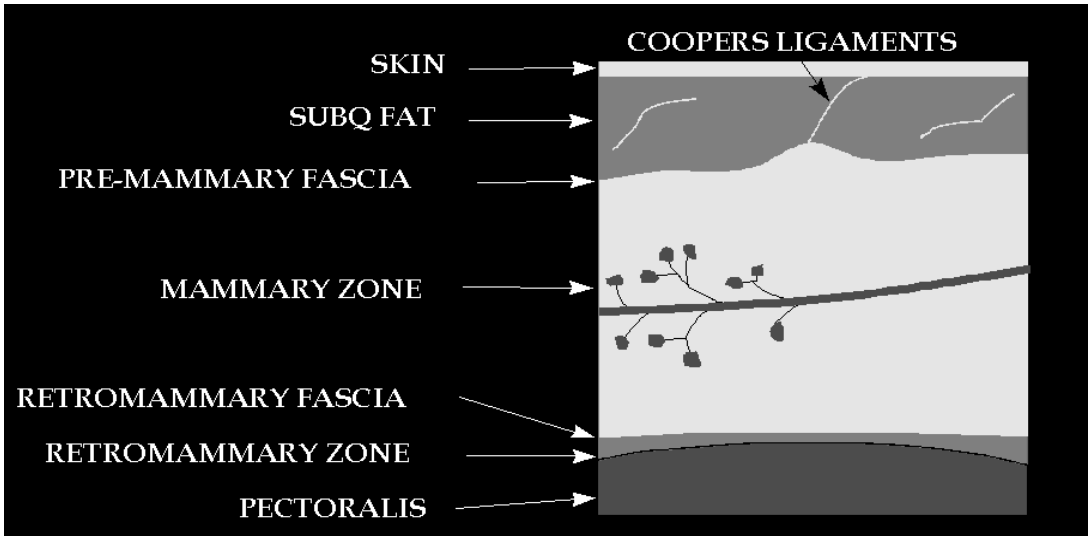
Developing breast has dense parenchymal pattern. With maturity, parenchyma assumes a transparent appearance. Breasts of nulliparous women involute more slowly than multiparous women. Hormone Replacement Therapy (HRT) may also be associated with symmetric or asymmetric increase in breast density (8) and it inhibits involutional processes causing persistence of dense P2 and DY patterns.

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 more

echogenic 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 (Schwartz's Principles of Surgery, 8th Edition) (6)

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

Fibrosis

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

GENERAL FEATURES

Mammographically these lesions are well defined, oval or round, and may show a complete radiolucent halo around the periphery due to Mach effect or compressed fat tissue around the mass. When the lesion is mostly of fat density it is usually benign. They may show few gentle lobulations (< 3).Some lesions may regress in size over a period of time especially in post menopausal women. Skin thickening and architectural

distortion may or may not be present. Some lesions show benign forms of calcifications (coarse, discrete, smooth monomorphic with central lucency, tea cup, punctuate or scattered).

On ultrasound they are oval or ellipsoid wider than deep (depth: width < 0.7) and aligned parallel to the skin. Smooth thin echogenic capsule with 2-3 gentle lobulations may be seen. They have variable echogenicity and are usually homogeneous with lateral edge shadowing and posterior enhancement. On color Doppler, vessels are seen to go around the mass.

MASTALGIA

Mastalgia – pain in breast – is the commonest breast symptom seen in both general practice and specialist referral clinics. Mastalgia as any other symptom, deserves full assessment and careful evaluation; it doest no imply any particular pathological process nor is it a diagnosis.

HISTORICAL ASPECT

Painful breasts are often regarded as part of a psychosomatic disorder (12). Sir Astley Cooper (1829) was aware of the syndrome of painful breasts but considered such complaints were of psychological origin and undeserving of further consideration: `The disease is met within persons of an irritable and nervous temperament, in whom there is excessive excitability of the system, accompanied by diminished power'. Fitzwilliam (1924) in his book on breast disease hardly mentions breast pain but devotes a whole chapter to hysterical breasts. Sir Hedley Atkins (1938) in his review of breast disease, recognized endocrine, neuralgic and psychological components of the problem of breast pain(12). He undertook a trial of oestrin in these patients but failed to demonstrate a beneficial effect. There are, of course, examples of patients with psychosomatic problems referred to the breast clinic but the work of Preece et al (1978)

has firmly established the organic nature of most episodes of breast pain. Preece et al (1978) compared patients with breast pain with a group of women (referred for consideration of a surgical procedure) with varicose veins. The psychological assessment was performed using the well validated Middlesex Hospital questionnaire (Crown et al, 1970) and showed that there was no increased psychological morbidity in the group of women complaining of painful breasts (12).

The development of severe pain and nodularity which may last for the most part of the menstrual cycle is considered as abnormal and may interfer significantly with the patient's everyday activities. In most cases, aberrant physiological or pathological processes underlie the symptom rather than neuroticism. Premenstrual breast pain is normal, but 10-15% of patients referred to breast clinics required treatment.

Recently, mastalgia has been classified into three distinct clinical syndromes (1) (Preece et al 1976, Bishop & Blarney 1979, Maddox et al 1989). Cyclical mastalgia accounts for two-thirds of cases. Cyclical pain, which is usually bilateral (some times it may be unilateral), varies during the menstrual cycle and is typically worse in the luteal phase and relieved by the onset of the menopause. Non-cyclical pain accounts for the remaining one-third, being further divided into true non-cyclical pain and chest wall pain which is either felt along the costo-chondral junction (Tietze's syndrome) or the lateral chest wall. This classification will identify those patients likely to respond to hormonal treatment (cyclical and true non-cyclical) and those who will not (chest wall pain).

MASTALGIA

Cyclical (Two thirds of Patients)

Non Cyclical (One third of patients)

True

Chest wall pain

Mammography is often utilized and is of potential value to rule out carcinoma and show signs of benign breast disease.

FIBROCYSTIC DISEASE

There is a miscellany of morphological alterations in the female breast are often grouped under the term fibrocystic changes. Fibrocystic changes represent the single most common disorder of the breast commonly presenting between 20 and 40 years of age with peak incidence just before menopause. One in every fourteen women develop palpable cyst. There are three principle patterns of morphological change 1) Cyst formation, often with apocrine metaplasia 2) Fibrosis 3) Adenosis. Cysts of the breast are usually round and well delimited. Often referred as blue dome cysts (Haagensen's diseases of the breast) (9).

Cysts develop when the lumina of the ducts and acini become dilated and lined by atrophic epithelium. Micro cysts are < 3mm in diameter and gross cysts are > 3mm in diameter. Gross cysts originate from blunt ducts and micro cysts.

Mammographically, they are indistinguishable from non calcified solid masses. Shape is variable according to the amount of fluid present within it and the amount of compression applied. Calcification occurs mostly in cysts that are greater than 10mm in diameter. It is present as a peripheral rim. Micro cysts may contain granules of calcified debris (milk of calcium). Ultrasonographically simple cysts are anechoic with posterior enhancement. Hemorrhage and infection may cause internal echoes or debris to be present. They are only partially mobile as they are attached to the glandular tissue.

FIBROADENOMA

Fibroadenoma (adenofibroma (9)) is a benign tumour composed of stromal and epithelial elements. It is the most common tumour of the breast in women younger than 30 years of age. They are firm, solitary tumours, and well encapsulated with smooth borders which may be lobulated.

Fibroadenomas appear mammographically as well circumscribed round or oval masses frequently, with gentle lobulations and rarely exceeding 3cm in size. Myxoid degeneration results in coarse nodular calcification. On ultrasound, they appear homogeneous and hypoechoic with posterior enhancement and edge shadowing. There is no reaction in the surrounding tissue and it is mobile. They may show posterior shadowing if calcification or hyaline degeneration is present. They are only slightly compressible and have their long axis parallel to the skin as they accommodate themselves to the local anatomy defined by beast nodules and cooper's ligaments with blood vessels passing around them.

GIANT FIBROADENOMA

Giant fibroadenoma is a descriptive term that applies to a fibroadenoma that attains an unusually large size, typically greater than 5 cm. Haagensen (9) calls these lesions massive adenofibromas in youth to denote their common occurrence in adolescent women.

PHYLLODES TUMOR

Phylloids tumours arise from intra lobular stroma. They can occur at any age mostly in the sixth decade. They constitute 1% of all primary tumours of the breast (10). A group of circumscribed biphasic tumours, basically analogous to fibroadenomas, characterized by a double layered epithelial component arranged in cleft surrounded by

an over growing hyper cellular mesenchymal component typically organized in leaf - like structures.

Mammographically, it resembles a large lobulated fibroadenoma with high soft tissue density. Some margins may be irregular suggesting local invasion. They may develop plaque like calcification. Ultrasonographically they are similar to fibroadenomas with well defined margins and posterior enhancement. The otherwise uniform echoes are usually broken up by fluid spaces. They are very vascular on color Doppler.

PAPILLOMA

Overall less than 10% of benign breast neoplasms correspond to papllomas, presenting mainly during 4^{th} and 5^{th} decade (10). A proliferation of epithelial and myoepithelial cells overlaying fibrovascular stalks creating an arborescent structure within the lumen of a duct. Intra ductal papilloma of the breast is divided into central (large duct) papilloma located in the sub areolar region and peripheral papilloma arising in the Terminal Duct Lobular Unit (TDLU). They are normally solitary and central and produce a serous or bloody discharge . Peripheral papillomas may occur in contiguous branches of the ductal system.

Mammographically, a lobulated fairly well circumscribed mass usually in the subareolar region is seen. Calcification may be punctate or similar to fibroadenoma. Ultrasound will show a solid mass within a dilated duct or cyst. Multiple papillomas tend to occur in younger women of less than 30 yrs and appear like fibroadenomas both clinically and on imaging.

FIBROMATOSIS (DESMOID TUMOUR)

Fibromatosis accounts for less than 0.2% of all breast lesions, more common in child bearing age(10). This is a locally aggressive lesion without metastatic potential

originates from fibroblasts and myofibroblasts within the breast parenchyma, excluding mammary involvement by extension of a fibromatosis arising from the pectoral fascia.

These have the same characteristics of abdominal desmoid tumors and also appear as round or oval circumscribed benign appearing masses. Rarely it may appear as a spiculate mass on mammography. Ultrasound may reveal a solid mass indistinguishable from a fibroadenoma.

SCLEROSING ADENOSIS

Sclerosing adenosis is characterized by a compact proliferation of acini with preservation of the luminal epithelial and the peripheral myoepithelial cell layers along with a surrounding basement membrane. Micro calcifications are common within the glands.

RADIAL SCARS

A benign lesion on imaging resembles invasive carcinoma. Grossly and at low power microscopy it resembles invasive carcinoma because the lobular architecture is distorted by the sclerosing process (11). The term radial scar has been applied to small lesions and complex sclerosing lesions to large ones that contain a variety of ductal epithelial hyperplasia along with sclerosis. They are often multiple and bilateral.

Radial scars are common in post Mastectomy and after large excision biopsies. Most are microscopic but some form larger (greater than 1 cm) palpable masses. They are benign lesions of unknown etiology that mimic malignancy on imaging. Mammogram shows spicules originating from a central nidus. But unlike Carcinoma, it does not have a central mass but only a central area of architectural distortion. Sonogram shows a hypo echoic mass with dense posterior acoustic shadowing.

GALACTOCELE

These are cysts containing inspissated milk, occurring in lactating women and in late pregnancy. Usual site is the central breast. On mammogram, they may have a mottled appearance with fat-fluid level on erect lateral view. On sonogram they appear solid sometimes.

LYMPH NODES

Axillary lymph nodes are oval masses with a fatty hilum and are usually less than 2 cms in size. Intra mammary lymph nodes are seen in the upper outer quadrant, posteriorly, as well circumscribed lobulated nodules of less than 1cm in size with a hilar notch and lucent center if fatty replacement has occurred. They may not be seen on ultrasound. They are seen in diseases like rheumatoid arthritis, sarcoidosis and infections like tuberculosis and other bacterial infections. Fine punctate calcifications maybe seen in sarcoidosis and are mimicked in patients with rheumatoid arthritis on gold therapy.

HEMATOMA

Trauma to the breast may result in hematoma formation which may present clinically and mammographically as an ill-defined mass mimicking a carcinoma. Occasionally, the late sequelae of a hematoma may resemble a carcinoma with micro calcification and architectural distortion. Ultrasound shows it to be hypo or hyper echoic depending on the duration. Shaggy walled cavities with echogenic debris and fluid that move with posture may be seen.

GRANULAR CELL (MYOBLASTOMA) TUMOR

This is an extremely rare benign lesion probably of Schwann cell origin with a 6 % rate of occurrence in the breast and most frequently seen in the 3rd to 5th decade(10). The tumor has a fibrous stroma with infiltrative margin mimicking a

scirrhous carcinoma clinically and mammographically. Sonographically, a hypo echoic mass with post acoustic shadowing and echogenic interface anterior to the hypo echoic lesion will be seen.

INFECTIONS:

ABSCESS:

Breast abscess is mostly encountered during lactation or in non-lactating women in relation to duct ectasia. Usually occurs in a central or subareolar location producing an irregular density with associated trabecular, skin or nipple distortion. Ultrasound shows a cyst with internal echoes, shaggy walls, intracavitary ehogenic gas bubbles and intense color signals at the hyperemic periphery.

TUBERCULOSIS:

Tuberculosis of the breast was first described by Cooper in 1829 as the ‘scrofulous swelling of the bosom'. Only a few clinical reports have been reported from the Indian subcontinent in spite of the high prevalence of other forms of tuberculosis in this region. The disease has been reported in the 20-50 years age group. Breast tuberculosis may be primary where the breast lesion is the only manifestation of the disease or it may be secondary in which a focus of tuberculosis has already been diagnosed elsewhere in the body and the disease appears in the breast at a later stage. The method of spread to the breast is by the hematogenous or lymphatic routes, or by direct extension from adjacent tissues.

The disease presents in three forms: nodular, diffuse and sclerosing. The nodular form is characterized by a slow growing caseating lesion and mammographically presents as a dense round area with indistinct margins. The diffuse form consists of multiple, intercommunicating foci of tuberculosis within the breast, which may caseate leading to ulceration and numerous discharging sinuses. The skin

may be thickened, with a tense and tender breast. In addition to the breast lesion, the axillary lymph nodes are frequently affected.

Radiographs show a dense breast and thickened skin. In the sclerosing form, excessive fibrosis rather than caseation is the dominating feature. Progress is slow and suppuration is rarely seen. The entire breast becomes hard because of the dense fibrous tissue and the nipple gets retracted. Increased density of the gland is seen on mammography. All the three forms of the disease are indistinguishable from breast cancer clinically as well as on mammography. The nodular form of the disease is more common and the lesions are hypo echoic sonographically with ill defined margins or complex cystic masses may be seen. In cases of diffuse tuberculosis ill-defined hypoechoic masses are seen. In patients with sclerosing tuberculosis, increased echogenicity of the breast parenchyma is seen with no definite mass.

FILARIASIS:

As with tuberculosis, a solitary inflammatory mass surrounding the filarial worms may mimic a carcinoma radiologically.

LIPOMA

This is a fatty tumor which on mammography appears as a lucent or less radio dense lesion with a well defined capsule and smooth rounded margin. Sonographically, it has the same echogenicity as surrounding fat.

FAT NECROSIS / OIL CYST

These are single or multiple, 2-3 cms in diameter and result from trauma which is usually surgical. They maybe asymptomatic or may present as a palpable mass. Mammogaphically, an irregular spiculated mass with or without calcifications or oil cyst or only calcifications may be seen. They may have curvilinear calcifications.

Sonographically, hypoechoic mass with posterior acoustic shadowing may be seen. Complex mass with mixed echotexture intra cystic soft tissue mass may also be a feature. An oil cyst shows echogenic oil floating over watery component.

ADENOLIPOMA / HAMARTOMA

These are often large when diagnosed, measuring greater than 6 cm, and are soft on clinical examination. Mammographic appearance depends on the fat and glandular tissue content. Thin soft tissue density capsule is usually present.

SKIN LESIONS

Sebaceous Cysts, warts, neurofibromas, keloid scars can be seen in the region of the skin. Mammographic opacity is usually very well defined because it is outlined by air.

STUDIES RELATED TO BENIGN BREAST DISEASES

Several studies have been conducted to evaluate the role of combined sonomammographic imaging in patients with palpable abnormalities of the breast.

In the ACR BI-RADS (14&15) a mass is defined as a space occupying lesion seen in at least 2 projections. If seen in only one projection then it is called as a density.

Lawrence W Basset (15) has described that when the margins of a lesion are not uniform throughout, then, the descriptor indicating the portion of greatest concern should be used.

Stavros et al (16) has reported that a mass to be characterized as benign on ultrasound should have 3 or less gentle lobulations.

Color Doppler is an adjunct to ultrasound in the differential diagnosis of benign tumors. Malignant tumors are characterized by more than 1 vascular pole (17,18).

Wendie A Berg et al (19) have studied cystic lesions of the breast with sonographic and pathological correlation and concluded that all clustered microcysts are benign but cysts with thick walls or septations (>=0.5mm), intracystic masses, or predominantly solid masses with eccentric cystic foci should be examined at biopsy as 23% of them had proved to be malignant. Also they have stated that size concordance, mammographic, sonographic, pathologic concordances are critical with papillary lesions as 2 of 12 lesions excised were malignant.

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 (20). However it requires state of the art equipment with appropriate technical settings to create an optimal image (21).

As reported by Manju Bala Popli (22) tuberculosis of the breast occurs in the upper outer quadrant of the breast and can appear nodular or diffuse with intercommunicating foci and discharging sinuses or sclerosed with increased density of the gland on mammography. Multiple chronic discharging sinuses suggest Tuberculosis.

The measured sonographic size of a mass may differ slightly from the mammographic size but significant differences cannot be reconciled readily by a change in imaging modalities. This principle is important because the majority of breast cysts are not visible on mammography (23). Lesions in the axillary region may also be more difficult to detect because of the overlying pectoralis muscle causing decreased contrast in this region (23).

Breast carcinoma is diagnosed in only 4 % of patients with breast symptoms indicating that appropriate management of breast physical findings is important for the primary physician (24).

There is considerable documentation that mammography is less useful in younger women due to greater likelihood of dense breast tissue composition (15, 25).

In women younger than 40 years, the normal glandular nodularity may be mistaken for dominant masses (27). Women with negative mammograms and ultrasound scans are at low risk for cancer but should be followed up at short term intervals with clinical examination and imaging if biopsy is not elected by their surgeon / clinician (24). Breast thickening is a particularly vague descriptor of a physical finding at clinical breast examination that encompasses a wide range of descriptions including breast nodularity; diffuse cystic change fibrocystic change and breast fullness (24). In this study 78% of the cases with breast thickening were normal when breast ultrasound was normal.

One of the various factors leading to false negative findings on mammography is the effect of breast density. In the study conducted by Pavel Crystal et al (28) out of 7 sonographically detected cancers 2 were in patients with BI-RADS category 4 and 5 were in patients with BIRADS category 3 parenchymal density. No carcinomas were detected with BIRADS category 2 density. No statistical difference was found in the number of cancers among a range of breast densities. Dense glandular tissue has a hyperechoic appearance on sonography, so hypoechoic cancers are easily detected.

According to Stephen H Taplin et al (29) BIRADS assessments and management recommendations are consistent for negative and benign assessments

and there is evidence of how well terminology consistent with BI-RADS was implemented in practice by 1997.

Ultrasound is not only helpful in the depiction of lymph nodes but also involvement of skin and pectoral muscle. In posterior lesions, especially those close to the chest wall musculature accurate measurement of the size and extension may not be possible with mammography prior to surgery (30).

In the study done by Mahesh K Shetty et al (13), palpable abnormality has a variety of descriptors – lump, thickening, knot and cord. In 2002 Mahesh K Shetty et al (13) have showed the value of combined sonomammographic assessment in patients with palpable breast abnormalities and have reported a sensitivity and negative predictive value of 100% each with a specificity of 80%. 40% of the lesions were categorized as benign after a combined evaluation showing the value of imaging in helping avoid unnecessary biopsies.

False negative rates of 0-2.6% have been reported in multiple studies for combined sonomammographic evaluation in patients with palpable abnormalities of the breast (15, 31, 32).

Moss et al (33) reported a sensitivity of 94.2% and specificity of 67.9% in 368 patients in who combined sonomammographic evaluation had been performed for palpable breast abnormalities and who underwent surgical biopsy.

Rotten D et al have studied the usefulness of 3D ultrasound in breast diseases (34,35). Benign tumors are surrounded by a continuous hyperechogenic rim, i.e. the rim is present irrespective of the section plane orientation. In case of

fibroadenomas, complete wall continuity of the mass was readily apparent. The hyperechoic bands of fibrous tissue peripheral to the masses appeared either as distinct from the central image (compressive pattern). Three-dimensional ultrasound mammography had higher specificity, but lower sensitivity, than two-dimensional ultrasound mammography.

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)

COIMBATORE MEDICAL COLLEGE HOSPITAL, COIMBATORE

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

Patient Name: Age: Sex:

Serial No. OP/IP No. :

Ward / Unit :

Complaints & History :

1. History of breast lump-duration and site.
2. H/o pain and whether related to menstrual cycle
3. H/o nipple discharge-serous or serosanguinous
4. H/o fever
5. H/o intake of oral contraceptive pills or surgeries for the breast
6. Menstrual history
7. Marital history
8. Obstetric history-last child birth and breast feeding
9. Family h/o of breast diseases

CLINICAL FINDINGS :

- Palpable lump, thickening, knot, cord
- Location, size and number
- Margins, consistency and mobility
- Associated findings: skin changes, nipple retraction, axillary lymph nodes.

CLINICAL DIAGNOSIS :

FINE NEEDLE ASPIRATION CYTOLOGY : **No.**

Date done: **Reported on:**

FINDINGS :

BIOPSY : **No.**

Date done: **Reported on:**

FINDINGS :

MAMMOGRAPHIC FINDINGS:

- Number, location and density of the lesion(s)
- Margins- well-defined, ill-defined, spiculated, obscured
- Shape - round, oval, irregular
- Architectural distortion and tenting
- Calcification
- Halo sign.
- Skin thickening
- Nipple retraction
- Axillary lymph nodes with benign or malignant features

Impression

SONOGRAPHY:

- Shape, size, number and location of the lesion(s)
- Orientation of the lesion (depth: width ratio)
- Margins
    - distinct/ indistinct
    - thin / thick/ mixed
    - smooth and regular/ irregular, spiculated, microcalcifications
- Echogenicity /echotexture
    - Homogeneous, anechoic/ hypoechoic/ hyperechoic
    - Heterogeneous, mixed echogenicity/ no cystic component
    - Complex predominantly solid
    - Complex predominantly cystic
- Posterior shadowing/enhancement/combined
- Effect on surrounding structures-architectural distortion, coopers ligament, distortion, edema
- Associated findings-dilated duct, skin thickening –focal/diffuse, skin retraction, calcification, pectoralis muscle invasion, lymph nodes
- Abnormal vascularity
- 3d features:

  Retraction pattern

  Compression pattern

  Indeterminate

Impression

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

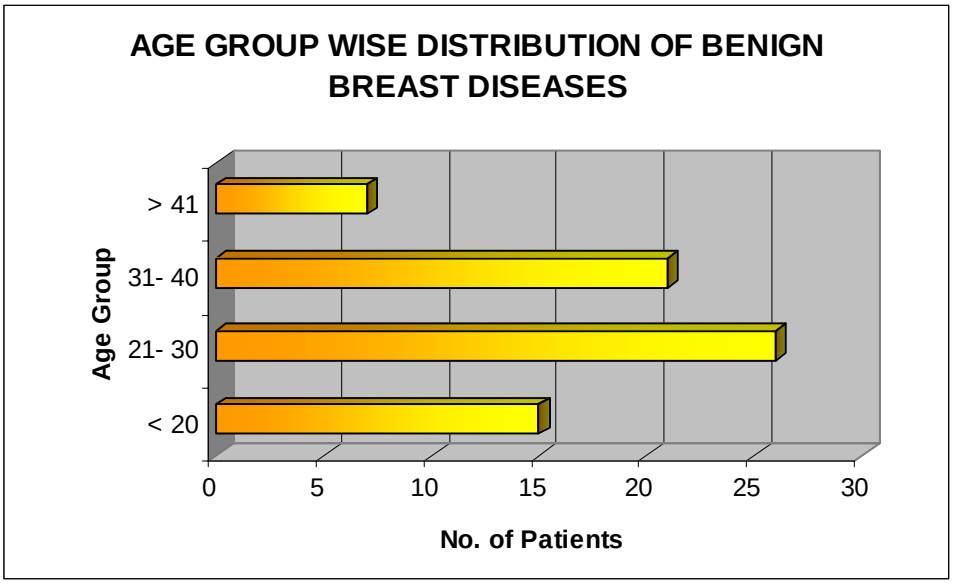


TABLE 2

ULTRASOUND AND MAMMOGRAPHIC COMPARISION

Mammography	Ultrasound
46	**64**

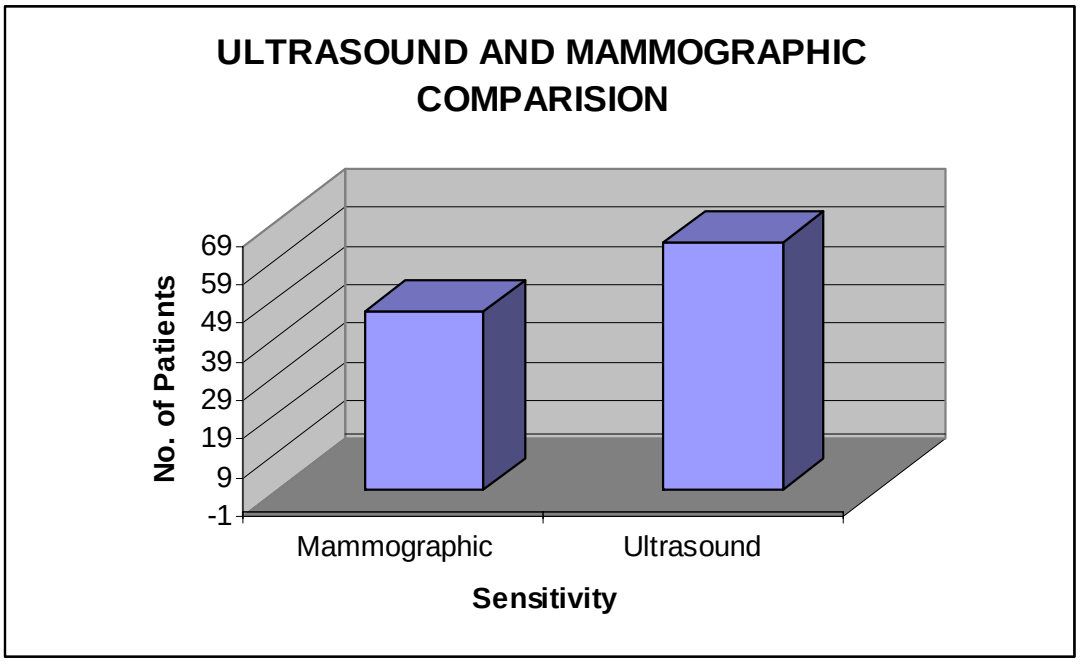


TABLE 3

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

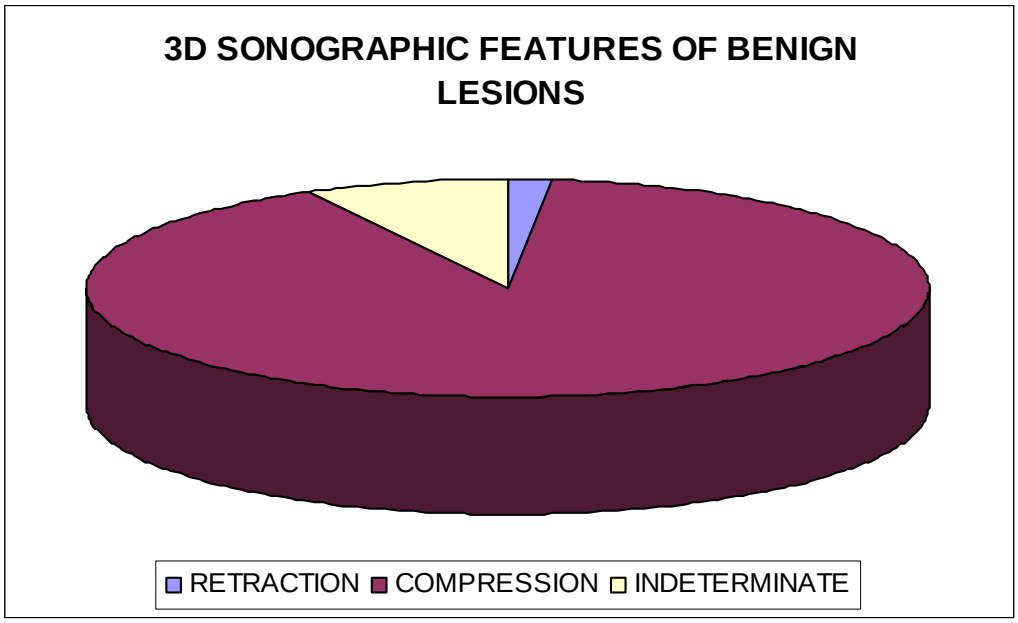


TABLE 4

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**

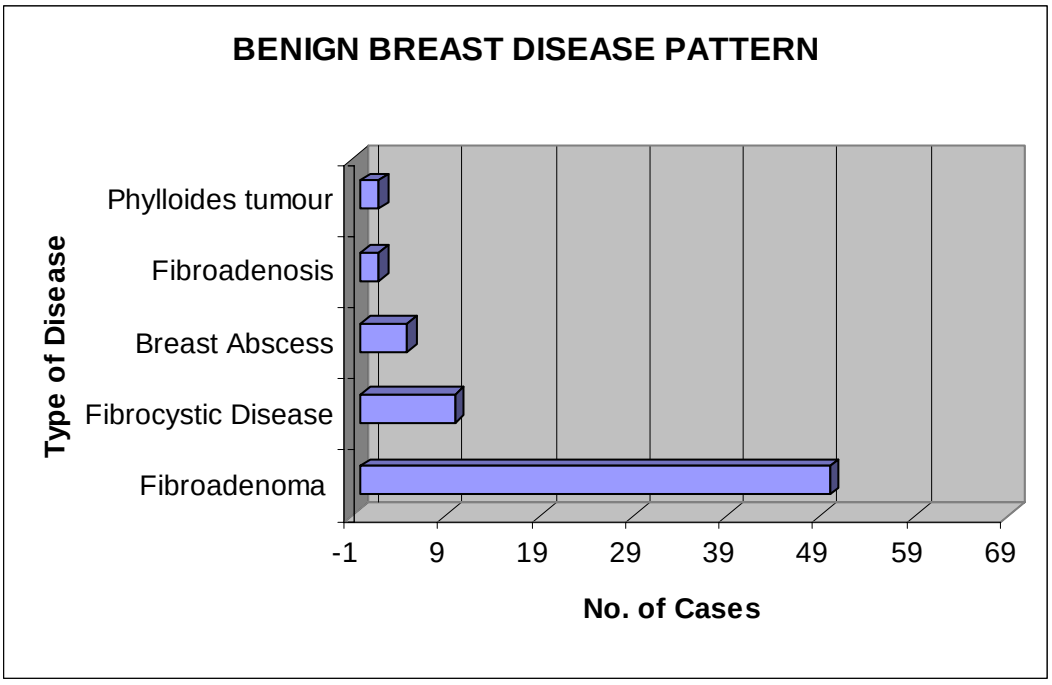
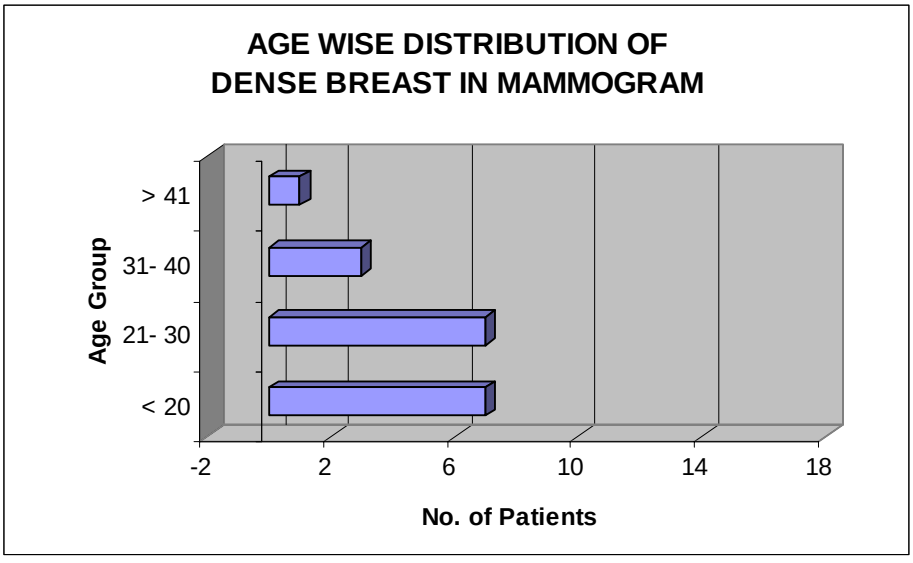


TABLE 5

MAMMOGRAPHICALLY DENSE BREAST

AGE WISE DISTRIBUTION

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



ILLUSTRATIVE EXAMPLES

CASE 1 - FIBROCYSTIC DISEASE

CASE 2 - FIBROCYSTIC DISEASE

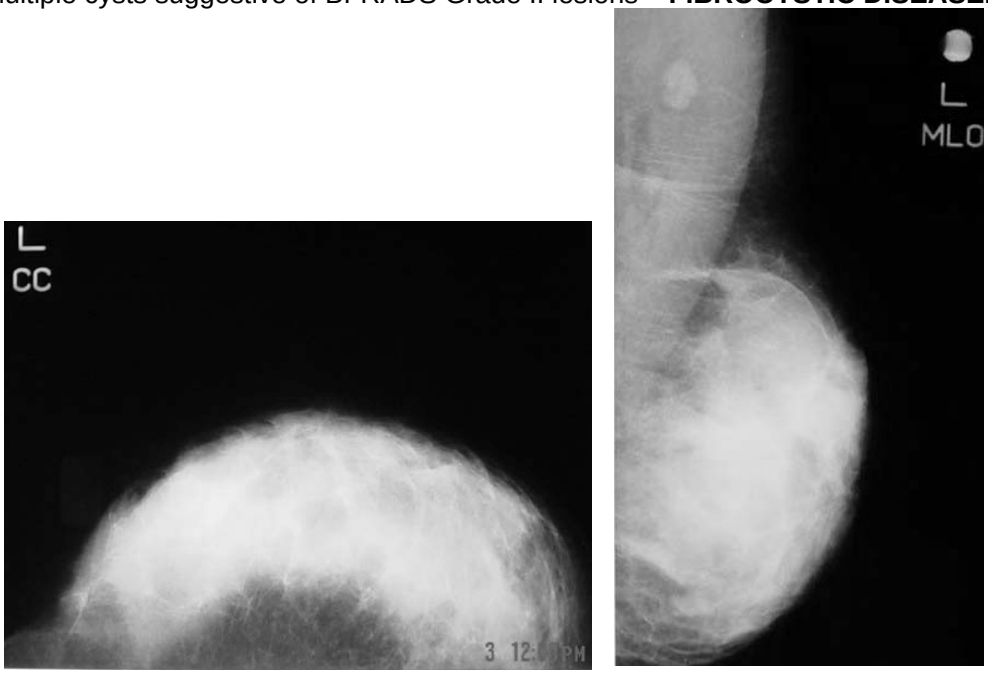
CASE 3 - BREAST ABSCESS

CASE 4 - TUBERCULAR BREAST ABSCESS

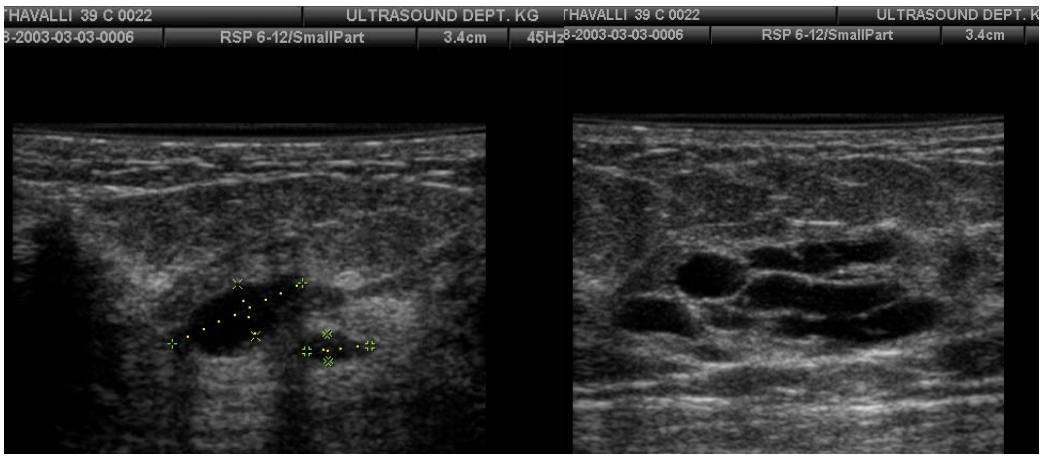
CASE 5 - FIBROADENOMA

CASE 1 - FIBROCYSTIC DISEASE

39 year old patient came with H/O left breast lumps. Mammogram showed Category IV BI-RADS parenchymal density with obscuration of lesions, not able to comment on nature of lesion on the mammography. U/S screening showed dilated ducts with multiple cysts suggestive of BI-RADS Grade II lesions – **FIBROCYSTIC DISEASE.**



Cranio-caudal and Medio-lateral oblique view Mammograms of the left breast



Ultrasound of the left breast showing cysts and dilated ducts

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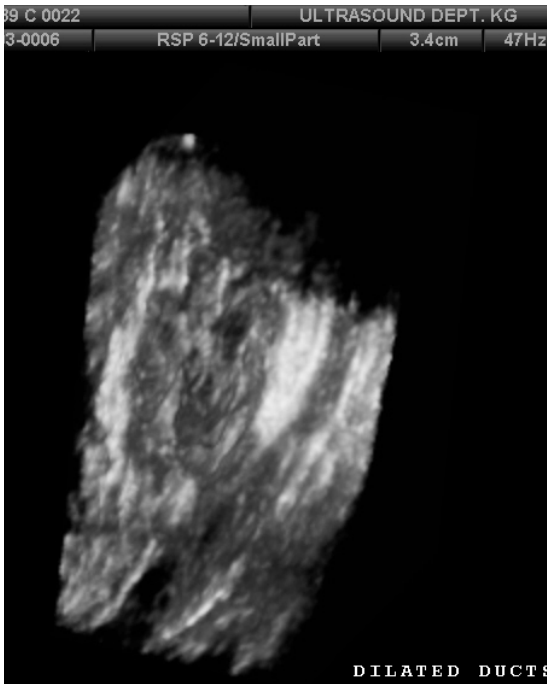

3D Ultrasound coronal Image

CASE 2 – FIBROCYSTIC DISEASE

40 year old patient came with H/O lumps in the left breast for 2 months duration. Mammogram showed multiple radiodense lesions in the left breast in all quadrants which on Ultrasound screening showed to be multiple cysts with compressive pattern on 3D coronal image. Findings were thus suggestive of fibrocystic disease BI-RADS Grade II which was proved by Histopathological correlation of the breast tissue - **FIBROCYSTIC DISEASE**.

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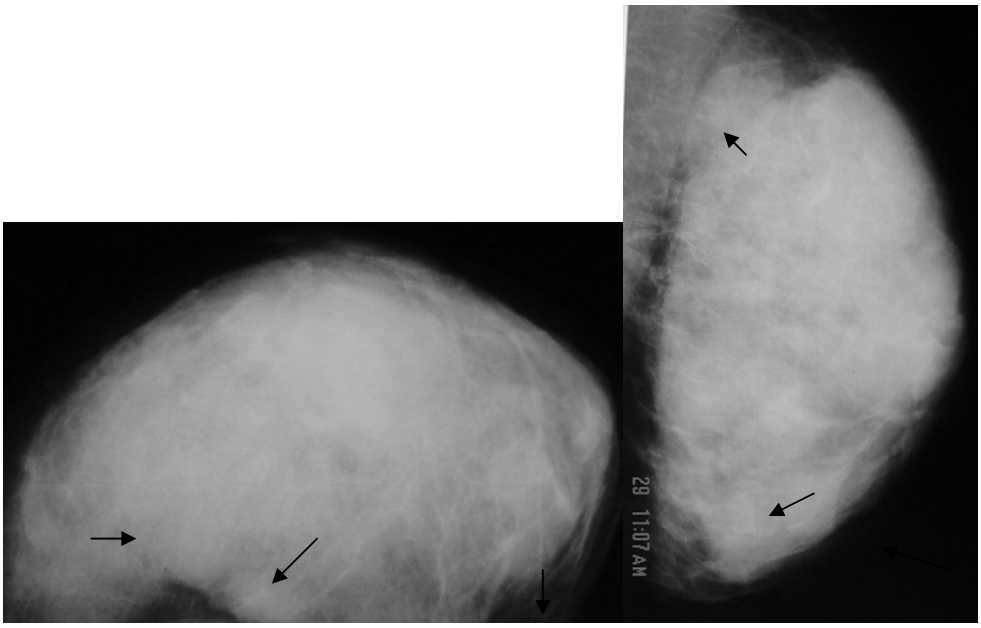
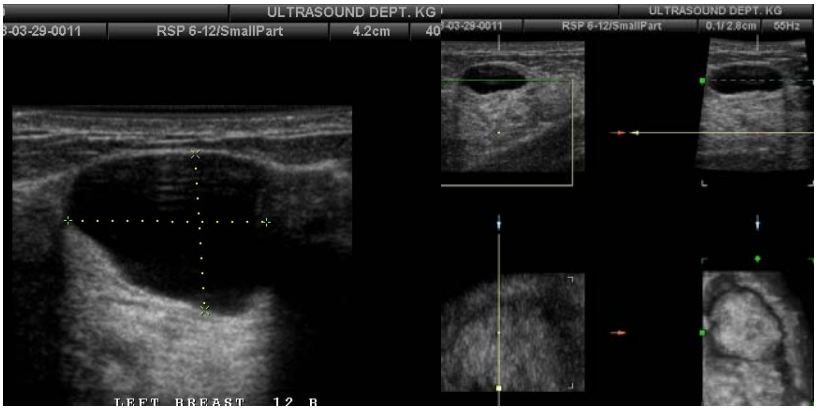
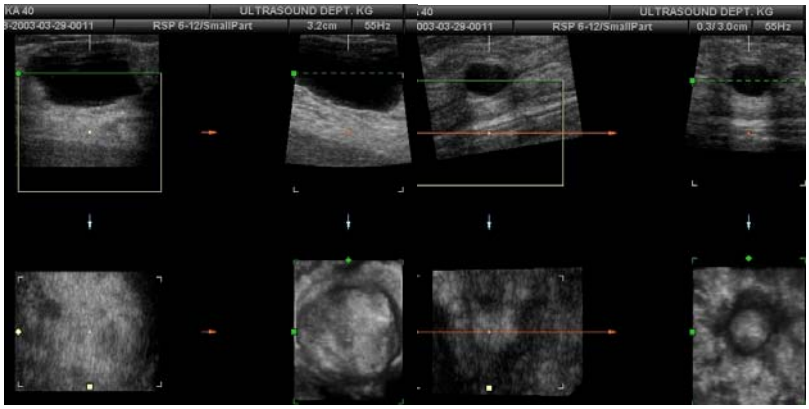


Cranio-caudal and Medio-lateral oblique view Mammograms of the left breast showing multiple radiodense lesions (arrows)





Ultrasound screening of left breast with 3D coronal reconstruction showed the cyst having well defined margins in the coronal planes with no irregularity of surrounding suggestive of compressive pattern.

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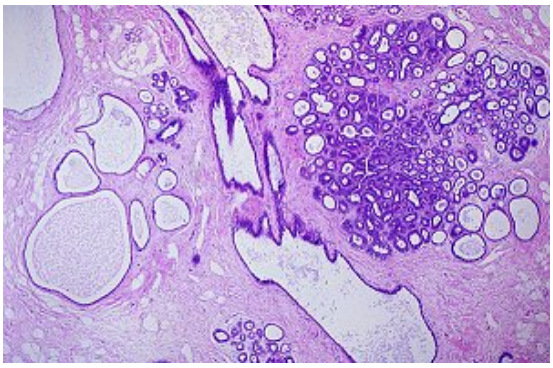
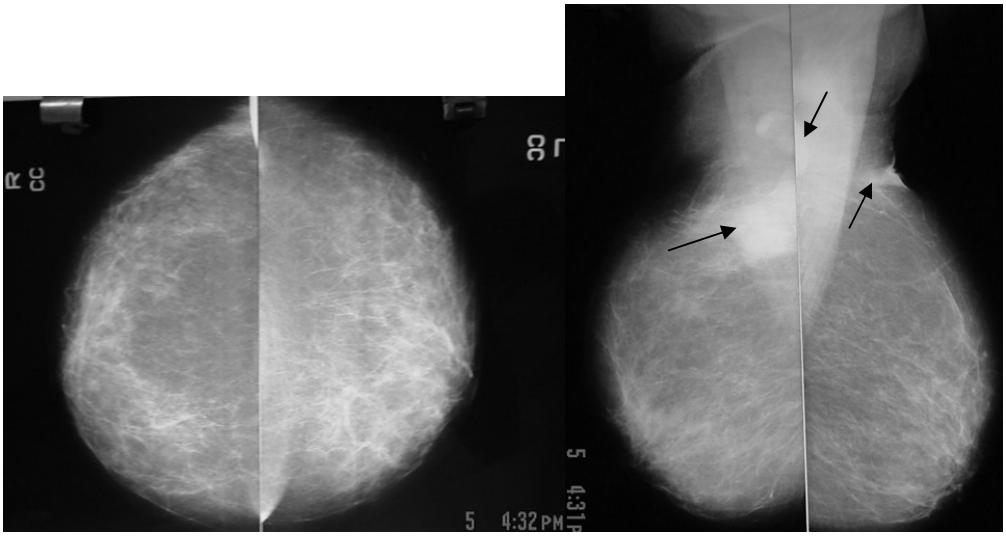


Histopathology of Left Breast tissue

CASE 3 – PYOGENIC BREAST ABSCESS

50 year old patient came with H/O lump in the right breast and H/O I&D done for a lump in the left axilla. Mammogram shows a radiodense lesion in the supero lateral quadrant of Right breast and irregular lesion in the left axilla suggestive a scar. Ultrasound showed a complex cystic lesion in the right breast and an irregular skin lesion in the left axilla with multiple hypoechoic lymph nodes. 3D coronal imaging of the lesion in the right breast revealed an indeterminate pattern. Findings were suggestive of a breast abscess with lymph nodal involvement – BI-RADS Grade II lesion. Histopathology proved the lesion in the right breast to be a **pyogenic breast abscess**



Cranio-caudal and Medio-lateral oblique view Mammograms of both breasts with radiodense lesions in the right superior quadrant and in the left axilla (seen only in the MLO views). CC view did not show the lesions because of their depth and lateral location.

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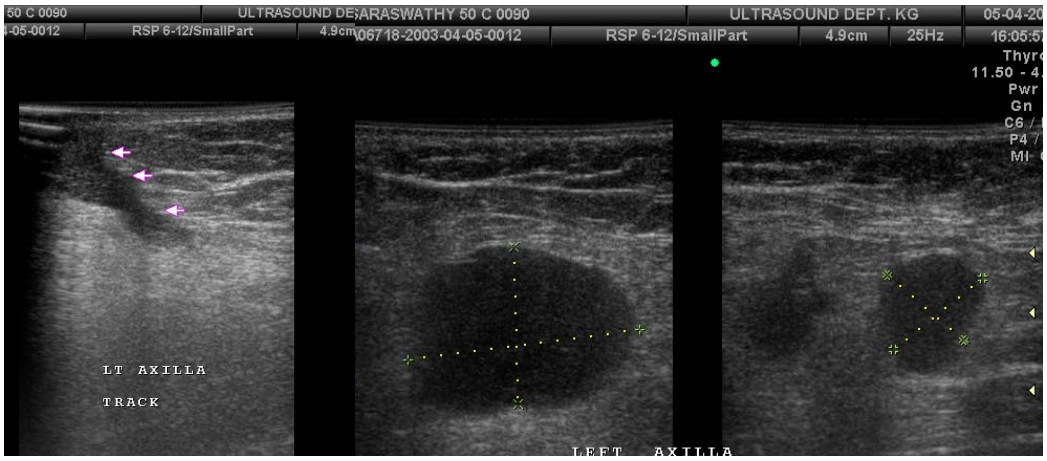
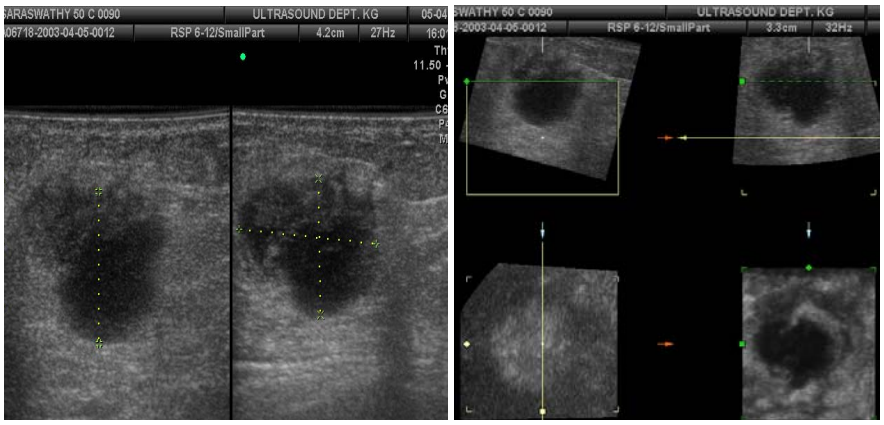
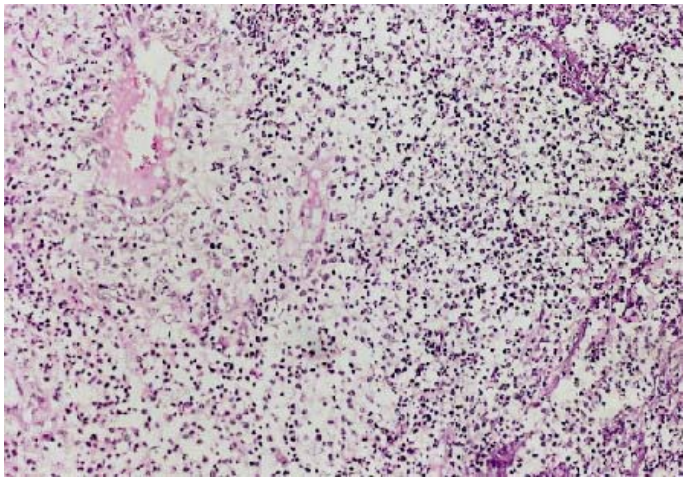


Ultrasound screening of left axilla showing Lymphnodes. The linear hypoechoic lesion in the left picture corresponds to the presence of a surgical scar.



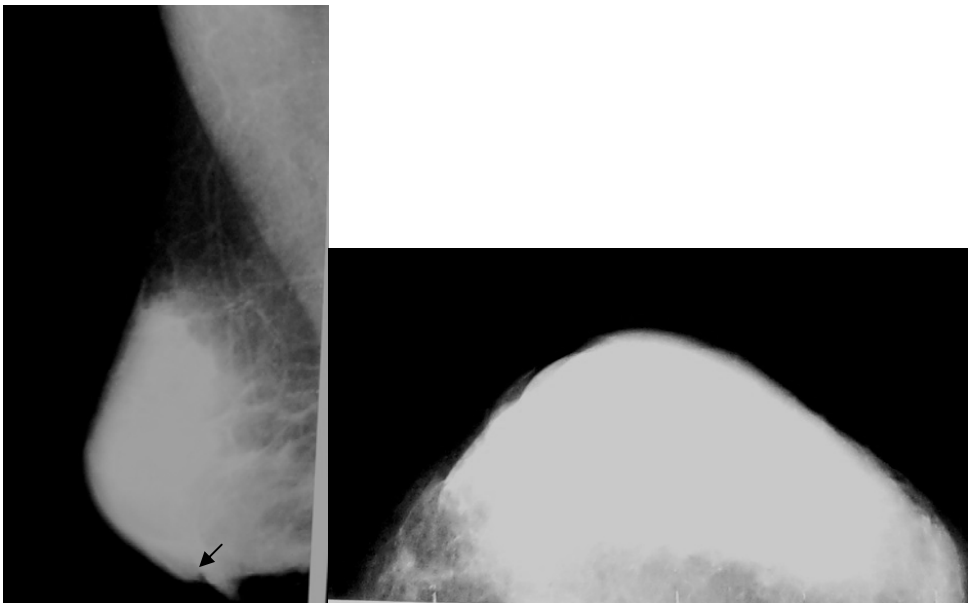
3D coronal image of Right Breast lesion



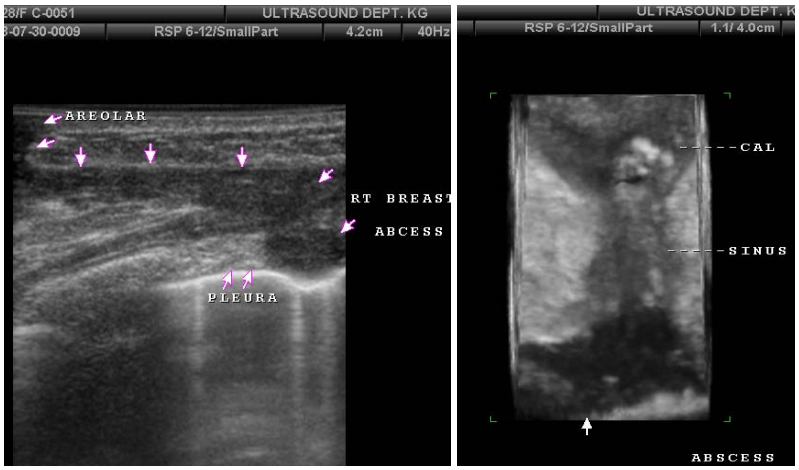
Histopathology of Right Breast Lesion

CASE 4 – TUBERCULOUS BREAST ABSCESS

28 year old patient came with H/O discharge from wound in the right breast. Mammogram showed bilateral dense breasts with skin discontinuity in the inferior aspect. Ultrasound 2D and 3D reconstruction showed an irregular cystic lesion with internal echoes and areas of calcification that was extending from the skin towards the deeper planes and into the pleural cavity. Findings were suggestive of **Tuberculous Breast abscess** – BI-RADS Grade II Lesion



Cranio-caudal and Medio-lateral oblique view Mammograms of the right breast showing BI-RADS Category IV parenchymal density and an area of skin discontinuity at the inferior aspect (arrow)



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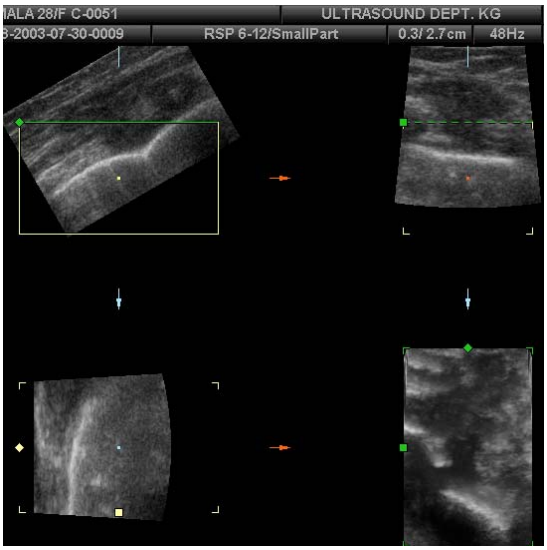
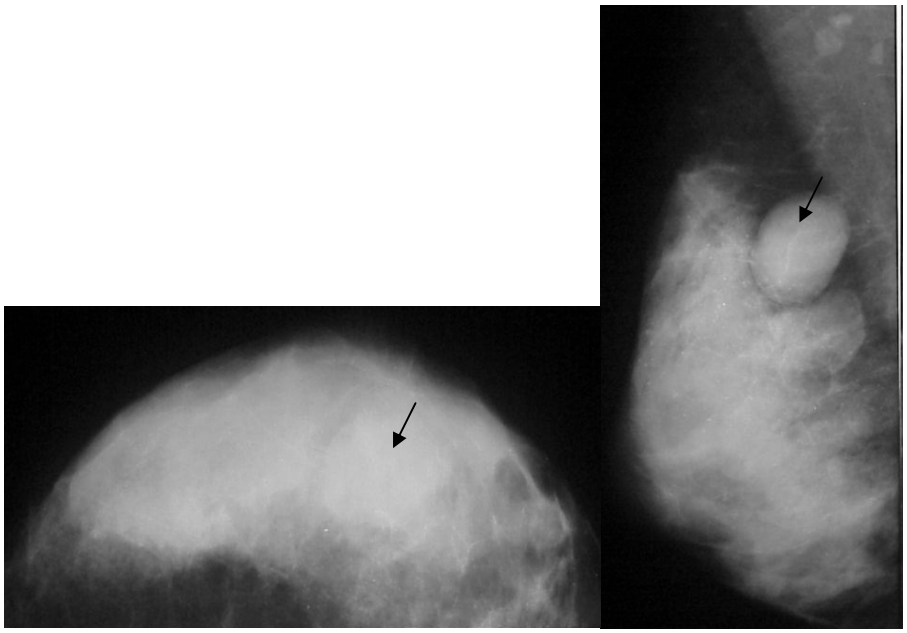


2D Ultrasound and 3D Reconstruction of right breast lesion

CASE 5 – FIBRO ADENOMA

24 year old patient came with complaints of palpable mass in the right breast. Mammogram shows a well defined radiodense lesion in the Right supero lateral quadrant with specks of calcification. Ultrasound screening showed a well defined hypoechoic lesion which showed a compressive pattern on 3D reconstruction and no abnormal vascularity on Doppler study. Findings were suggestive of a fibroadenoma – BI-RDAS Grade III lesion. Histopathology of the lesion showed it to be a **Fibroadenoma.**



Mammogram of the right breast showing well defined radiodense lesion with specks of calcification and halo sign in the supero lateral quadrant

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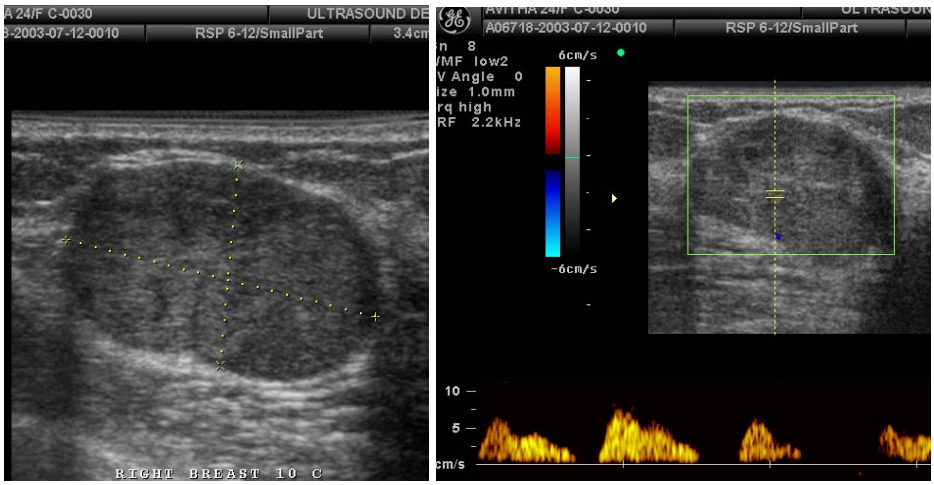
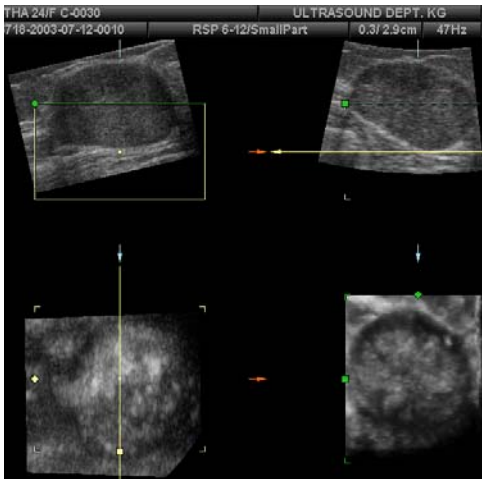
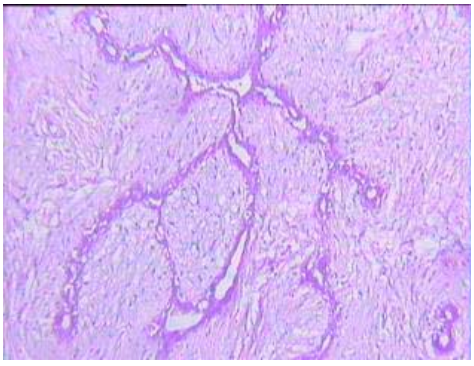


2D ultrasound screening and Doppler study of the right breast lesion.



3D coronal reconstruction of right breast lesion



Histopathology of the right breast lesion.

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 does

physical 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 palpable

abnormalities, 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 investigation

delineated 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.

BIBLIOGRAPHY

1. Recent advances in surgery 21 by I.Taylor 1998 pg 71-83
2. Robins Pathologic basis of disease 6th ed 1999 ch25 pg 1093-1120
3. Longman's Medical embryology 9th ed 2004 pg 431
4. Recent advances in surgery 11 by R.C.G.Russel 1982 pg101-128
5. Lee McGregor's Synopsis of surgical anatomy 12th ed 1986 ch13 161-171
6 Schwartz's Principles of surgery 8th ed ch16 pg 453-499
7 Pub med (National library of medicine, USA). Radio l Med (Torino). 1994 Sep; 88(3):295-300
8 Text book of Radiology and Imaging by David Sutton 7th ed pg 1451-1488
9 Haagensen Diseases of the Breast 3rd ed 1986
10. World Health Organization. Tumours of the breast Histological typing 2nd edition.
11. Sabiston Text book of Surgery 17th ed ch32 pg 867-944
12. Progress in surgery vol l by I.Taylor 1985 pg 27-36
13. Mahesh K. Shetty, Yogesh P. Shah et al. Prospective evaluation of the value of combined mammographic and sonographic assessment in patients with palpable abnormalities of the breast. journal of ultrasound in medicine 2003; 22:263-268
14. American College of Radiology: Breast Imaging Reporting and Data System (BI-RADS) Ed Reston, VA, American College of Radiology 1998.
15. Lawrence W Basset. Imaging of Breast Masses. RCNA July 2000 Volume 38.
16. Stavros A.T, Thickman D et al. Solid breast nodules: use of sonography to distinguish between benign and malignant lesions. Radiology 1995; 196: 123-134
17. DO Cosgrove, RP Kedar, JC Bamber et al. Breast diseases: color Doppler ultrasound in differential diagnosis. Radiology 1993; 189: 99-104.
18. S Raza and JK Baum. Solid breast lesions: evaluation with power Doppler ultrasound. Radiology 1997; 203: 164-168.
19. Wendie A Berg, Cristina I Compassi et al. Cystic lesions of the Breast-Sonographic- pathological correlation. Radiology 2003;227: 183-191.
20. WW Logan-Young, NY Hoffman, and JA Janus. FNAC in the detection of breast cancer in non suspicious lesions. Radiology 1992; 184: 49-53

21. Jay A. Baker, Mary Scott Soo. Breast ultrasound: Assessment of technical quality and image interpretation. Radiology April 2002; 223: 229-238.

22. Manju Bala Polpli. Tuberculosis of the Breast. IJRI 1999; 9: 3: 127-132.

23. R. James Brenner. False negative mammograms - RCNA July 2000 Volume 38, Number 4:741-757

24. Jacqueline S. Kaiser, Mark A Helvie et al. Palpable breast thickening – Role of mammography and ultrasound in cancer detection. Radiology June 2002; 223:839-844.

25. Diagnosis of breast cancer in younger women. Aust NZ Surg 1991; 61: 284-289.

26. Thomas M Kolb, Jacob Lichy et al. Comparison of the performance of screening mammography, physical examination and breast ultrasound and evaluation of the factors that influences them. An analysis of 27,825 patient evaluations. Radiology Oct 2002; 225:165-175.

27. F M Hall. Sonography of the breast. Controversies and opinions. AJR 1997; 169: 1635-1636.

28. Pavel Crystal, Selwyn D Strano et al. Using sonography to screen women with mammographically dense breasts –AJR 2003; 181:177-182

29. Stephen H Taplin, Laura E Ichikawa et al. Concordance of Breast Imaging Reporting and Data System Assessments and Management recommendations in screening mammography. Radiology 2002; 222: 529-535.

30. Isil Gunhan Bilgen, Esin Emin Ustun et al. Inflammatory Breast Carcinoma: Mammographic, ultrasonographic, clinical and pathological findings in 142 cases. Radiology 2002; 223:829-838

31. Mark A Dennis, Steve H. Parker Anita J. Klaus et al. Breast biopsy avoidance: The value of normal mammograms and normal sonograms in the setting of a palpable lump. Radiology April 2001; 219: 186-191.

32. Linda Moy, Priscilla J Slanetz, Richard Moore et al. Specificity of mammography ultrasound in the evaluation of a palpable abnormality: Retrospective Review. Radiology 2002; 225: 176-181.

33. Moss HA, Britton PD, Flower CD, Freeman AH, Lomas DJ, Warren RM.How reliable is modern breast imaging in differentiating benign from malignant breast lesions in the symptomatic population? Clinical Radiology 1999; 54: 676-682.

34. Rotten D, Levaillant JM, Constancis E, Collet Billon A et al. Three-dimensional imaging of solid breast tumors with ultrasound: preliminary data and analysis of its possible contribution to the understanding of the standard two-dimensional sonographic images. Ultrasound Obstet Gynecol. 1991 Nov 1;1(6):384-90.

35. Rotten D, Levaillant JM, Zerat L**.**Analysis of normal breast tissue and of solid breast masses using 3D ultrasound mammography. Ultrsound Obstet Gynecol 1999; 14: 114-124

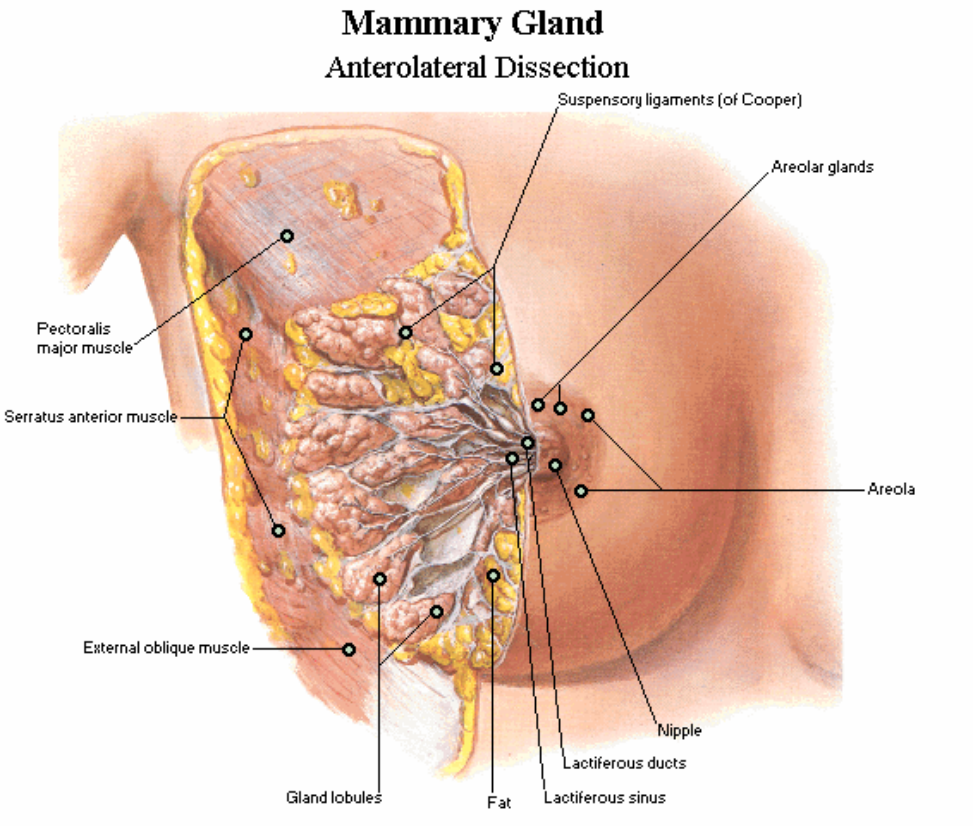
36. Use of 3D ultrasound mammography to analyse normal breast tissue and solid breast masses. In Merz E, ed 3D ultrasonogrphy in Obstetrics and Gynecology. Philadelphia: Lipponcott Williams and Wilkin, 1998: 73-78.

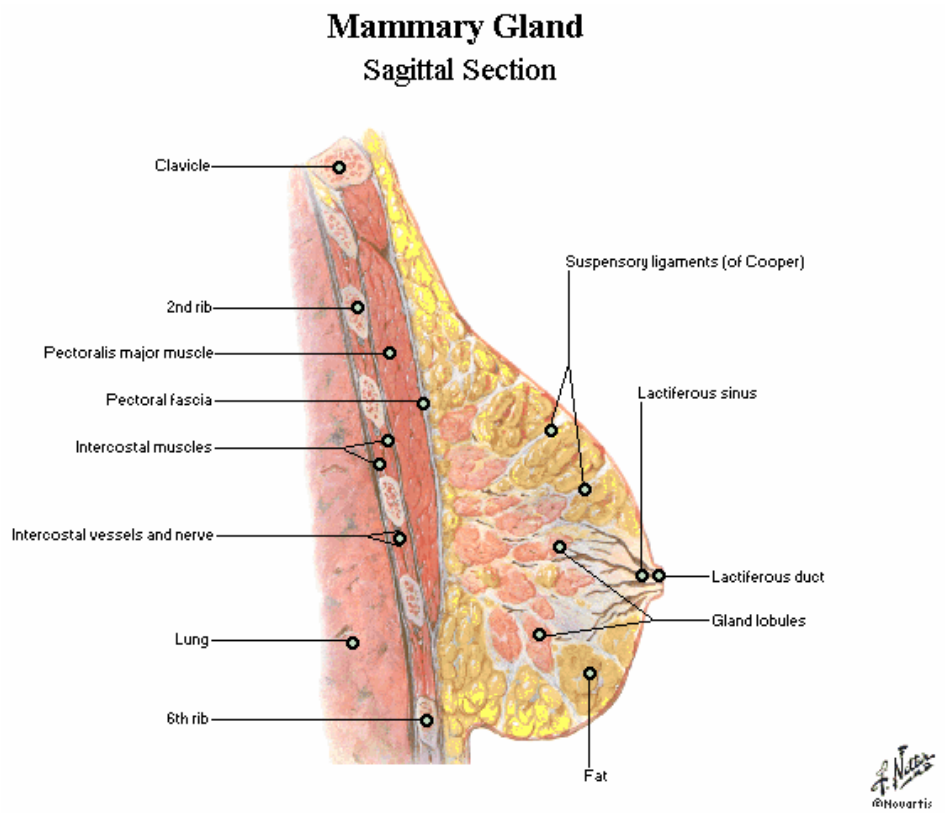
37. Isabelle Leconet, Chantal Feger, Christine Galant, et al., Mammography and Subsequent Whole – Breast Sonography of Non palpable Breast Cancers : The important of Radilologic Breast Density. AJR : 180,. June 2003, 1675-1679.

38. Atlas of clinical Anatomy by Frank H.Netter 1997 plates 167-169

39. Current surgical therapy by John.L.Cameron 8th ed 2004 pg 615-625

ANATOMY OF BREAST (38)





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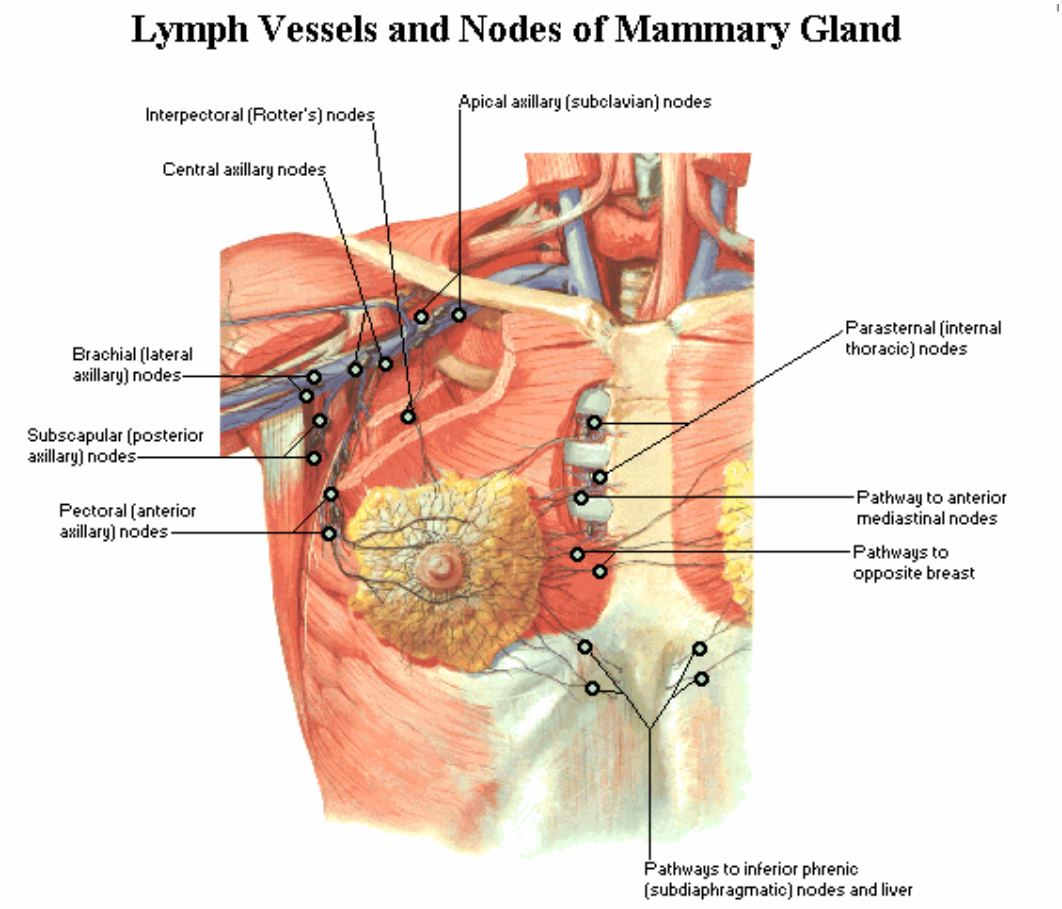

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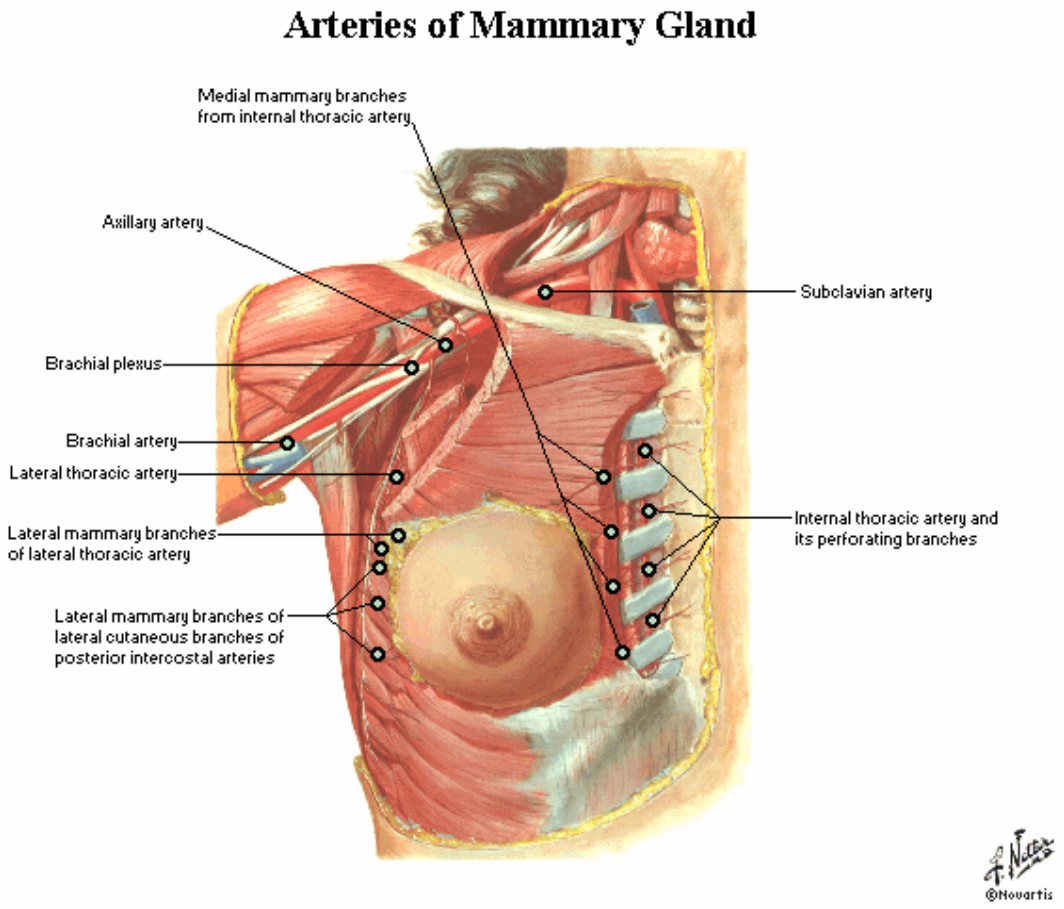

S.No.	Name	Age	IP. /OP.No.	Clinical Diagnosis	FNAC	Mammography	Ultrasound	3D USG	BIRADS Probable Diagnosis	HPE	Follow-up
1	Parvathy	45	OP 8140	Lt. Fibro Adenoma	Fibrocystic Disease	Dense Breast	Round Shape, Well defined B/L Fibrocystic disease, Fibroadenoma Lt.	Comp	II	Fibrocystic Disease	Conservative treatment
2	Natchammal	37	IP 17348	Lt. Fibro cystic disease	Fibrocystic Disease	Dense Breast Fibroadenoma Lt. Brem RD	Round Shape, Well Defined	Comp	II	Fibroscystic Disease	Conservative treatment
3	Rajalakshmi	19	IP18068	Rt. Fibroadenoma	Fibroadenoma	Dense Breast	Fibroadenoma Rt. Breast Round Shape, Well Defined	Comp	III	Excision Fibroadenoma Rt.	Excision done
4	Krishnaveni	3	OP9954	Lt. Fibro Adenoma	Fibroadenoma	Fibroadenoma CT	Multiple fibroadenoma Lt. Rt.	Comp	II	Excision Fibroadenoma Rt.	Excision Done
5	Karuppathal	27	IP32368	Rt. Fibroadenoma	Fibroadenoma	Dense Breast	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Rt. Excision Done
6	Thilagamani	28	OP36416	Lt. Fibro Adenoma	Fibroadenoma	Lt. Round Fibro adenoma	Lt. Fibroadenoma Rt. Small lesions	Comp	IV	Fibroadenoma	Lt. Excision Done
7	Janaki	35	OP 6883	Lump Rt. Breast	Fibrocystic Disease	Benign Lesion Lt. Side Fibrocystic Disease	B/L Multiple Fibroadenoma	Comp	III	Floride Adenosis	Excision Done
8	Saroja	39	IP36916	Lump Rt. Breast	Fibrocystic Disease	Multiple Benign Lesion fibrocystic disease	Giant Fibroadenoma Rt.	Comp	IV	Fibrocystic Disease	Incision biopsy conservative management
9	Soujath	17	IP 51391	Fibroadenoma	Fibroadenoma	Dense Breast Lt.	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
10	Kalyani	31	IP17347	Lt. Fibroadenoma	Lt.Fibro adenoma	Fibroadenoma Lt	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
11	Revathi	24	OP 6992	Lump Rt. Breast	Breast Abcess	Lt. Radio Dense Lesion	Lt. Breast Abscess	indeterminate	II	Breast Abcess	Drained
12	Indira	34	IP 32247	Lt. Fibroadenoma	Fibroadenoma	Lt. Fibro adenoma	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
13	Kaliyammal	55	IP 66568	Lump Rt. Breast	Abscess	Rt. Radio Dense lesion	Rt. Abscess	indeterminate	II	Breast Abcess	Drained
14	Shanthi	34	IP 65174	Lt. Fibroadenoma	Fibroadenoma	Lt. Fibro adenoma	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
15	Prabhavathy	29	IP 52969	Lt. Fibroadenoma	Lt.Fibro adenoma	Lt. Fibro adenoma	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
16	Musthirabanu	14	OP 4450	Lt. Fibroadenoma	Lt.Fibro adenoma	Dense Breast	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
17	Nagamani	20	OP 8631	Lump Lt. Breast	Fibroadenoma	Lt. Fibro adenoma	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
18	Vijaya	37	OP 4217	Fibroadenoma Lt. Breast	Fibroadenoma	Lt. Fibro adenoma	Fibroadadenoma Lt.	Comp	III	Fibroadenoma	Excision biopsy
19	Sundarammal	27	IP 49437	Lump Lt. Breast	Breast Abcess	Radiodense Lesion with ill defined margins	Breast abscess	Intermediate	III	Breast Abcess	Drained
20	Kamalam	23	OP 553	Fibroadenoma Rt.	Fibroadenoma	Dense Breast	Fibroadenoma Rt. Breast R WD	Comp	III	Fibroadenoma	Excision done

21	Angathal	55	IP 13888	Lump Rt. Breast	Fibro cystic disease	Rt. Giant Fibroadenoma and phyllaids tumour	Phylloids tumour Rt	Comp	III	Phylloides Tumour	Excision biopsy
22	Preethamary	23	OP 20347	Lt. Fibro Adenoma	Fibroadenoma	Lt. Fibro adenoma	Lt. Fibroadenoma	Comp	IV	Fibroadenoma	Excision done
23	Rajeswari	18	OP 48157	Lt. Fibro Adenoma	Fibroadenoma	Lt. Fibro adenoma	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
24	Shakila	27	IP 40141	Lt. Fibro Adenoma	Fibroadenoma	Rt. Fibroadenoma	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision
25	Sumithra	21	IP 1889	Rt. Fibroadenoma	Fibroadenoma	Rt. Fibroadenoma	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
26	Kamala	20	OP 12087	Lump Rt. Breast	Fibroadenoma	Rt. Fibroadenoma	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
27	Amaravathy	24	IP 65758	Rt. Fibroadenoma	Fibroadenoma	Rt. Fibroadenoma	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
28	Naseera	19	OP 2716	Rt. Fibroadenoma	Fibroadenoma	Rt. Fibroadenoma	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision done
29	Remja	32	OP 9194	Lt. Fibroadenoma	Fibroadenoma	Lt. Fibroadenoma	Fibrocystic Disease Lt.	Comp	II	Fibrocystic disease	Excision done
30	Dhanalakshmi	37	IP 5525	Lt. Fibroadenoma	Fibroadenoma matoid hyperplasia	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision
31	Amsabegam	22	OP7567	Rt. Fibroadenoma	Fibroadenoma matoid hyperplasia	Dense Breast	Rt. Fibroadenoma with fibrocystic changes	Comp	III	Fibroadenoma	Excision
32	Lakshmi	39	IP5608	Lump Rt. Breast	Fibrocystic Diseases	Dense Breast BD, Rt Fibroadenoma	Fibrocystic Diseasese Rt. Fibroadenoma	indeterminate	III	Fibroadenoma	Excision
33	Kavitha	27	IP 35387	Lumpt Lt	Fibroadenoma	Dense Breast	Fibroadenoma	Comp	III	Fibroadenoma	Excision
34	Kaliammal	47	IP 55337	Fibroadenoma Lt.	Fibrocystic Diseases	Giant Fibroadenoma	Phylloids tumour Benign	Comp	III	Phylloides Tumour	Excision
35	Kamarinisha	21	OP1475	Lt. Abscess	Breast Abcess	B/L Dense Breasts, Dense lesion Lt.	Breast abscess Lt	Intermediate	II	Tuberculous breast abcess	Drained
36	Thulasimani	45	OP4334	Lt. Abscess	Breast Abcess	Bilateral Dense Breast	Breast Abcess	Intermediate	II	Breast Abscess	Aspirated
37	Fathima	19	IP43375	Fibroadenoma Rt.	Fibroadenoma	Dense Breast	Fibroadenoma Rt.	Comp	III	Fibroadenoma	Excision
38	Suganthi	35	IP40960	Lump Lt. Breast	Fibrocystic Disease	Dense Breast	B/L Fibrocystic Diseases	-	II	Fibrocystic Disease	lt. Excision of Lump
39	Maheswari	19	IP55952	FAD Rt	Fibroadenoma	Fibroadenoma	Fibroadenoma Rt.	Comp	III	Fibroadenoma	Excision
40	Prabha	25	IP56625	Rt FAD	Fibroadenoma	Dense Breast	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision
41	Kalaimagal	32	IP 54167	Lt FAD	Fibroadenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision
42	Vijayalakshmi	43	IP 37970	Lt. Fibroadenoma	Fibroadenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision

43	Parvathy	50	IP 36743	Rt. FAAD	Fibroadenoma	Rt. Fibroadenoma	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision Done
44	Radha	23	IP 62651	Rt. FAD	Fibroadenoma	Dense Breast	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision Rt.
45	Muthulakshmi	16	IP 62719	Rt. FAD	Fibroadenoma	Dense Breast	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision
46	Selvi	19	IP 51048	Fibroadenoma Lt.	Fibroadenoma	Dense Breasts	Lt. Fibroadenoma	Comp	III	Fibroadenoma	Excision
47	Sabeena	19	IP11763	Lt. FAD	Fibroadenoma	Dense Breasts	Lt. Fibroadenoma	Comp	II	Fibroadenoma	Excision
48	Leena	23	IP27809	Rt. FAD	Fibroadenoma	Dense Breasts & Benign Lesion Rt.	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision
49	Parvathy	32	IP52861	FAD Rt.	Fibroadenoma	Rt. Fibroadenoma	Rt. Fibroadenoma	Comp	III	Fibroadenoma	Excision
50	Krishnaveni	20	OP2917	Lt. Fibroadenoma	Fibrosystic disease	Lt. Benign lesions	Rt. Fibroadenoma Lt. Fibroadenoma	Comp	III		Conservative treatment
51	Kalyani	31	OP 12347	lt. Breast Multiple Fibroadenoma	Fibroadenoma	Fibroadenoma Lt.	Fibroadenoma Lt.	Comp	III		Conservative treatment
52	Vidhya	35	OP 8451	Lt. Fibroadenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III		Conservative Management
53	Rathinam	23	OP6827	Rt. Fibroadenoma	Fibroadenoma	Fibroadenoma Rt.	Rt. Fibroadenoma	Comp	III		Conservative treatment
54	Omana	28	OP3011	Lt. Fibroadenoma	Fibro adenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III		Conservative Management
55	Jagadeswari	19	OP4603	Rt. Fibroadenoma	Fibro adenoma	Rt. Fibroadenoma	Rt. Fibroadenoma	Comp	III		Conservative Management
56	Kavitha	20	OP17153	Lt. Fibroadenoma	Fibro adenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III		Conservative Management
57	Vijayalakshmi	22	OP484	Lt. Fibroadenoma	Fibro adenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III		Conservative
58	Valliyammal	21	OP3902	Rt. Fibroadenoma	Fibro adenoma	Rt. Fibroadenoma	Lt. Fibroadenoma BRITOS III	Comp	III		Conservative
59	Easwari	25	OP1240	Lump Rt. Breast	Fibro adenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III		Conservative
60	Valarmathi	30	OP5806	Fibrocystic Disease	Fibrocystic Disease	Dense Breast	Fibrocystic Disease	Comp	III		Conservative
61	Parvathy	35	OP7891	Lump Lt. Breast	Fibro adenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III		Conservative
62	Ranjitha	26	OP232	Lt. Lump	Fibro adenoma	Lt. Fibroadenoma	Lt. Fibroadenoma	Comp	III		Conservative
63	Valli	37	OP636	Lt. Lump	Fibrocystic Disease	Dense Breast	Lt. Fibroadenoma	Comp	II		Conservative
64	Renganayaki	21	OP2343	Rt. Fibroadenoma	Fibro adenoma	Rt. Fibroadenoma	Rt. Fibrocystic Disease	Comp	II		Conservative

65	Vasuki	30	OP9568	Lump Rt.	Fibro adenosis	Rt. Benign Lesion	Rt. Fibrocystic Disease	Comp	II		Conservative
66	Jayamani	37	OP39774	Lump Rt.	Fibrocystic diseases	Rt. Benign Lesion	Rt. Fibrocystic Disease	Comp	II		Conservative
67	Chellammal	35	OP3684	Rt. Fibroadenoma	Fibroadenoma	Rt. Fibroadenoma	Rt. Fibroadenoma	Comp	III		Conservative
68	Roja	35	OP2748	Rt. Fibroadenoma	Rt.Atypical cells	Multiple Benign Masses	Rt. 12B B IV Fibroadenoma, Fibroadenosis, Smart Cyst Lt.	RE	IV, III		Conservative Treatment
69	Geetha	24	IP25822	Lt. Fibroadenoma	Fibrocystic Disease	Normal	Focal Fibrocystic Champs	Comp	II		Conservative