

# **AN ANALYSIS OF NON-NEOPLASTIC BREAST DISEASES WITH SPECIAL FOCUS ON DIAGNOSTIC ACCURACY OF FNAC**

*Dissertation Submitted to*

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

*in partial fulfillment of the regulations  
for the award of the degree of*

**M.S. BRANCH – I  
GENERAL SURGERY**



**GOVT. STANLEY MEDICAL COLLEGE & HOSPITAL  
THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY  
CHENNAI, INDIA.**

**SEPTEMBER 2006**

## **CERTIFICATE**

This is to certify that the dissertation titled “**AN ANALYSIS OF NON-NEOPLASTIC BREAST DISEASES WITH SPECIAL FOCUS ON DIAGNOSTIC ACCURACY OF FNAC**” of

**Dr. K. ARUN PRASAD** in partial fulfilment of the requirements for **M.S. Branch – I (General Surgery)** Examination of the Tamilnadu Dr. M.G.R. Medical University to be held in September 2006. The period of study was from February 2004 to January 2006.

**UNIT CHIEF**

**PROFESSOR AND HEAD  
DEPARTMENT OF SURGERY**

**DEAN**

Govt. Stanley Medical College & Hospital,  
Chennai-600 001.

## **DECLARATION**

I, **Dr. K. ARUN PRASAD** solemnly declare that dissertation titled, “**AN ANALYSIS OF NON-NEOPLASTIC BREAST DISEASES WITH SPECIAL FOCUS ON DIAGNOSTIC ACCURACY OF FNAC**” is a bonafide work done by me at Govt. Stanley Medical College & Hospital during 2004-2006 under the guidance and supervision of my Unit Chief

**Prof. S.DEIVANAYAGAM, M.S.,**

Additional Professor of Surgery

The dissertation is submitted to Tamilnadu Dr. M.G.R. Medical University, towards partial fulfillment of requirement for the award of **M.S. Degree (Branch – I) in General Surgery.**

Place : Chennai.

Date :

**(Dr. K. ARUN PRASAD)**

## **ACKNOWLEDGEMENT**

I owe my thanks to the Dean, Govt. Stanley Medical College and Hospital, **Dr. M. VASANTHA, M.D.** for allowing me to avail the facilities needed for my dissertation work.

I am grateful to **Prof. Dr. D.R. GUNASEKARAN, M.S, FICS**, Professor and Head of the Department of Surgery, Govt. Stanley Medical College Hospital for permitting me to do the study and for his constant encouragement.

I am so thankful to our former unit chief **Prof. Dr. M. AMARANATHAN, M.S.** for his valuable guidance and suggestions.

I am extremely thankful to my unit Chief **Prof. S. DEIVANAYAGAM, M.S.**, for his guidance and encouragement.

I sincerely thank **Dr. GUNASEELAN, M.S**, Surgical Registrar, Stanley Medical College Hospital who has been our Chief incharge for his valuable guidance.

I extend my sincere thanks to Professor and H.O.D., Department of Pathology **Dr. A. SUNDARAM, M.D.** for his extensive guidance in undertaking the role of FNAC in non-neoplastic breast diseases.

I owe my sincere thanks to our Assistant Professors

**Dr. ZAHIR HUSSAIN, M.S., Dr. MANIVANNAN, M.S. and  
Dr. MANOHARAN, M.S.,** for their valuable guidance and appropriate suggestions.

I thank my senior colleagues, my fellow postgraduates and my junior colleagues, without whose help this study would not have been possible.

Last but not the least, my sincere thanks to all the patients who cooperated for this study, without whom this study could not have been possible.

# CONTENTS

<b>S. No.</b>		<b>Page No.</b>
1.	INTRODUCTION	01
2.	AIM OF THE STUDY	03
3.	ANATOMY AND PHYSIOLOGY OF BREAST	04
4.	CLASSIFICATION	11
5.	CLINICAL AND PATHOLOGICAL ASPECTS	14
6.	INVESTIGATION OF BREAST DISEASES	24
7.	CYTOLOGY OF THE NORMAL BREAST	31
8.	CYTOLOGY OF NON NEOPLASTIC BREAST DISEASES	33
9.	MANAGEMENT	37
10.	PATIENTS AND METHODS	46
11.	OBSERVATIONS AND RESULTS	48
12.	REVIEW OF LITERATURE	56
13.	DISCUSSION	58
14.	CONCLUSION	69
	PROFORMA	
	MASTER CHART	
	BIBLIOGRAPHY	

## INTRODUCTION

Breasts are the most important feature of female anatomy and an integral part of the reproductive system. They are symbols of fertility and womanhood. They serve very significant roles, especially function of lactation. The breast presents a plethora of benign pathological conditions. Benign breast diseases are 4-5 times more common than the malignant counterpart.

**Definition** : Non neoplastic breast diseases may be defined as all breast disorders with the exclusion of malignant and benign neoplasms of the breast.

Non-neoplastic breast diseases forms more than 50% of all benign breast diseases and the literature supporting these diseases in India is scanty. Among the non-neoplastic breast diseases fibrocystic disease and mastalgia are more common problem in the west but finds little mention in our country. The purpose of this study is to profile various non-neoplastic breast disease among South Indian Women, and special focus is made on diagnostic accuracy of FNAC among them.

Most breast complaints are benign and non-neoplastic in nature. Despite this most women with breast complaints “assume the worst” when a new problem is discovered. This is understandable, but to help allay fears, an understanding of the non-neoplastic breast diseases is needed. Unlike breast malignancy non-neoplastic breast diseases are difficult to understand, in part due to the variety of names that have been used to describe various conditions.

In many times what bring a women to see her doctor is no more than an aberrations in

normal development and involution (ANDI). The term ANDI is useful since it implies that most of the non-neoplastic breast disorders are in fact only physiological (i.e. normal) extremes but still normal. This is important, since reassurance and explanation is often the only treatment required. When the same problem goes beyond 'ANDI' category it is truly be considered abnormal and managed accordingly.

Investigation of non-neoplastic breast diseases essentially follows the same principles of 'Triple assessment' that are used in breast malignancy however, young women in particular may not require every test in order to diagnose a non-neoplastic lesion.

Management of these disorder involves a combination of reassurance, medical treatment and some times surgical excision, obviously when malignancy is found incidentally in a patient with non-neoplastic breast lesion, has to be dealt with same fashion as a routine for malignancy.

## **AIM OF THE STUDY**

### **The main aim of the study are**

1. To find out the incidence of various non-neoplastic breast diseases and their age distribution in Stanley Medical College Hospital, Chennai.
2. To identify the common clinical presentations of non-neoplastic breast diseases.
3. To find out the association with menstrual status, parity and lactation.
4. To analyse the diagnostic accuracy of FNAC in non-neoplastic breast diseases, and
5. To study the medical and surgical management aspects of non- neoplastic breast diseases.

# **ANATOMY AND PHYSIOLOGY OF BREAST**

An understanding of the development, anatomy and physiology of the breast and its various endocrine interrelationships is essential to study the patho-physiology of the breast as well as for the management of various breast diseases.

## **DEVELOPMENT OF BREAST**

The breast is a modified sweat gland and begins to develop as early as the fourth week as a down growth from a thickened mammary ridge (milk line) of ectoderm along a line from axilla to the inguinal region. Supernumerary nipples or even glands proper may form at lower levels on this line.

Lobule formation occurs only in the female breast and does so after puberty. Each Lactiferous duct is connected, to a tree-like system of ducts and lobules, intermingled and enclosed by connective tissue to form a lobe of the gland.

The resting (non-Lactating) breast, however, consists mostly of fibrous and fatty tissue; During pregnancy alveoli bud off from the smaller ducts and the organ usually enlarges significantly, and more so in preparation for Lactation. When Lactation ceases involution of secretory tissue occurs. After menopause progressive atrophy of lobes and ducts takes place.

## **ANATOMY OF BREAST**

The adult female breast lies in the subcutaneous tissue (superficial fascia) of the anterior thoracic wall and is separated from underlying muscles by the deep fascia. Despite individual

variations in size, the extent of the base of the breast is fairly constant.

**Extent :**

**Vertical** : 2<sup>nd</sup> to 6<sup>th</sup> ribs

**Horizontal** : Side of the sternum to the midaxillary line.

About two thirds of the breast rests upon the pectoralis major muscle, one third on the serratus anterior muscle. Lower medial quadrant rest on external oblique aponeurosis, which separates it from the rectus abdominis muscle.

**Axillary tail of Spence :**

It is a prolongation from the upper outer part of the breast which passes upto the level of the 3<sup>rd</sup> rib in the axilla through a opening in the axillary fascia called foramen of Langer.

### **Architecture of the breast :**

The breast is composed of acini which make up lobules, aggregations of which form the lobes of the gland. The lobes are arranged in a radiating fashion like the spokes of a wheel and converge on the nipple, where each lobe is drained by a duct. Ten to fifteen collecting ducts open onto the nipple, each duct draining segmental system of smaller ducts and lobules. The ducts are surrounded by connective tissue which is characteristically loose and vascular.

### **Ligaments of Cooper :**

The breast is anchored to the overlying skin and to the underlying pectoral fascia by bands of connective tissue called “Ligaments of Cooper”.

### **Blood supply of the breast :**

This is derived from

- Lateral thoracic artery branch of 2<sup>nd</sup> part of Axillary artery (main supply).
- Internal thoracic artery through its perforating cutaneous branches
- The lateral branches of the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> 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 into axillary, internal mammary and intercostal vessels.

**Nerve supply :**

The secreting tissue is supplied by sympathetic nerves which reach it via the 2<sup>nd</sup> to the 6<sup>th</sup> intercostal nerves. The overlying skin is supplied by the branches of 4<sup>th</sup> to 6<sup>th</sup> intercostal nerves.

**Lymph drainage :**

Around 75% of the Lymphatic drainage of the breast passes to axillary lymph nodes, mainly to the anterior group of nodes, although direct drainage to central or apical nodes is possible.

Much rest of the lymphatic drainage, originating particularly from the medial part of the breasts, is to parasternal nodes along the internal mammary artery.

Few lymphatics follow the intercostal arteries and drain to posterior intercostal nodes. The superficial lymphatics of the breast have connections with those of the opposite breast and the anterior abdominal wall, from the extraperitoneal tissues of which there is drainage through the diaphragm to posterior mediastinal nodes. Direct drainage from the breast to supraclavicular nodes is possible.

**PHASIC CHANGES IN THE BREAST**

Unlike most tissues of the body that completes growth and development during embryonic or Juvenile phases of life, mammary gland exhibits maximum growth potential during puberty and reaching the peak during pregnancy and lactation. Breast experiences multiple cycles of proliferation, differentiation and regression in association with repeated menstrual cycles and during pregnancy.

## **DURING MENSTRUAL CYCLE :**

### **Proliferative phase :**

The number of mitosis within the acini of breast decreases and small luminal space widens gradually.

### **Secretory phase :**

The Luminal space widens still further and the lining epithelial cell develop microvilli. Glycogen deposition occurs followed by true apocrine secretion.

## **Menstruation :**

The lumen remains distended but cellular activity decreases. According to Haagensen, there is no change in the number of lobules and acini in premenstrual phase. The change in size and density observed may be attributed to blood, lymph or extravascular fluid. Recently it has been suggested that there is little change in total body water content through the phases of the menstrual cycle.

## **During pregnancy and lactation :**

**First trimester** : During this period the lobular size gradually increases and the epithelial cells shows marked changes with cytoplasmic vacuolations and prominent nuclei with few mitotic figures.

**Second trimester** : During this period, the lobules are markedly increases in size, with acini being distended by secretion. Epithelial cells shows organelle development and microvilli at luminal surface.

**Third trimester** : During this period, the breast further increases in size which resulting in obliteration of stromal structure. Myoepithelial cells do not proliferate as such but are elongated and stretched. A yellowish fluid, the colostrum can be expressed from the nipple.

**Lactation** : During this period, the acini attains the maximum distension with secretion of milk which also fills the ductal system of the breast.

## **Involution Phase :**

The involution of the breast takes place soon after termination of breast feeding. The morphometric studies suggest lobular volume reduction with loss of epithelial elements begins as early as 3<sup>rd</sup> decade of life and continues till the end of 6<sup>th</sup> decade. This phenomenon does not depend upon ovarian function alone as noticed by good lobular development of breast even in castrated women.

# CLASSIFICATION OF NON NEOPLASTIC BREAST DISEASES

## ANDI

- Cyclical nodularity and mastalgia
- Cysts

### A. From the duct system

Fibroadenosis

Galactocele

Serocystic disease of Brodie

### B. From the stromal system

Lymphatic cyst

Hydatid cyst

## INFLAMMATORY BREAST DISEASE

A. ACUTE : Bacterial mastitis

B. CHRONIC :

Intramammary abscess

Subareolar abscess

TB/Fungal /Parasitic

C. DUCT ECTASIA / PERIDUCTAL MASTITIS

## II. EPITHELIAL HYPERPLASIA

## III. CONGENITAL DISORDERS

Inverted Nipples

Supernumerary Breast / Nipples

Amazia / Polymazia

### **TRAUMATIC BREAST DISORDERS**

Fat Necrosis

Haematoma

### **PREGNANCY RELATED**

Galactocele

Puerperal abscess

### **NON BREAST DISORDERS**

Tietze's Disease

Sebaceous cyst and other skin conditions

## CLASSIFICATION AND PATHOPHYSIOLOGY

Frame work of pathogenesis of non neoplastic breast diseases

<b>S. No</b>	<b>Reproductive Period</b>	<b>Normal Process</b>	<b>Non Neoplastic Breast Disorder</b>	<b>Non-Neoplastic Breast Disease</b>
1	Development	Ductal development  Stromal development	Nipple inversion  Single duct obstruction  Adolescent breast hypertrophy	Mammary duct  Fistula  (Severe form)
2	Cyclical change	Hormonal activity	Mastalgia  Nodularity  (Focal or diffuse)	(Severe form)
3.	Pregnancy and Lactation	Epithelial hyperplasia  Lactation	Galactocele  Inappropriate lactation	Puerperal abscess
4.	Involution	Lobular involution  Ductal involution  Fibrosis dilatation  Micro papillomatosis	Cysts and sclerosing adenosis  Nipple retraction  Duct ectasia  Simple hyperplasia	Periductal mastitis with suppuration  Lobular hyperplasia without atypia  Ductal hyperplasia without atypia

## CLINICAL AND PATHOLOGICAL ASPECTS

The nomenclature of non- neoplastic breast disease is very much confusing in the past and to sort out this problem, a new system called Aberrations of normal development and involution (ANDI) has been developed and described by the Cardiff Breast Clinic. Many alternative terms have been applied to this condition, including fibro cystic disease, fibroadenosis, chronic mastitis and mastopathy.

### **Aetiology :**

The breast is a dynamic structure that undergoes changes throughout a women's reproductive life and, super imposed upon this cyclical changes throughout the menstrual cycle. The pathogenesis of ANDI involves disturbances in the breast physiology extending from an extreme of normality to well defined disease processes.

### **Clinical features :**

The symptoms of ANDI include an area of Lumpiness and / or breast pain (mastalgia)

- A discrete smooth lump in breast is commonly a breast cyst or fibroadenoma.
- Lumpiness may be unilateral or bilateral, common site is upper outer quadrant of the breast.
- The symptoms may be cyclical or non cyclical in nature.

### **I) MASTALGIA :**

#### ***Definition :***

The presence of pain in the breast lasting for more than 2 weeks in one menstrual cycle or of sufficient intensity to interfere with normal life.

No single hypothesis has been able to explain the cause. Water retention, endocrine

abnormalities and dietary excess or deficiencies are few probable causes. However mastalgia commonly reflects hypersensitivity of the breast epithelium to normal circulating level of hormones.

**Classification :**

1. Cyclical
2. Non cyclical

**Cyclical mastalgia :**

It accounts for 2/3 of mastalgia group and is usually bilateral. It varies during menstrual period more during luteal phase and get relieved with the onset of menstrual flow. The basic cause being hormonal either oestrogen excess or progesterone deficiency. Abnormal prolactin secretion also been suggested.

### **Non cyclical mastalgia :**

It occurs more commonly in premenopausal than post menopausal women.

It is usually unilateral and takes a chronic course and may be associated with ANDI or periductal mastitis. It should be distinguished from referred pain like musculoskeletal disorder.

### **II) FIBRO CYSTIC DISEASE :**

Fibro cystic disease is seen predominantly during the early years of middle age, largely the decade prior to the menopause. Women often develop a palpable lump which most frequently are well formed and fluid filled cysts. There is also an associated increase in fibrous tissue with an irregular distribution within the breast.

Cysts are common lesions, particularly in the decade preceding the menopause. The precise mode of formation of cysts is unknown, but it is likely that they occur by the inflation of individual acini and lobular units. Cysts are usually lined by a characteristic epithelium mimicking that found in the apocrine sweat glands. Multiple cysts are more common than simple cyst. However cysts are not indicative of increased cancer risk. Cysts remain an important clinical problem because of their presentation as mass lesion and their varied histopathological and biochemical components merit further study. Fibrocystic disease is usually bilateral, frequently involves upper and outer quadrant and associated with pain and tenderness.

### **PATHOLOGY**

Fibrocystic disease consists essentially of four features that may vary in extent and degree in any one breast.

1. Cyst Formation : Cyst are more common and very variable in size.
2. Fibrosis : Fat and elastic tissue disappears and is replaced with dense white fibrous

trabeculae. The interstitial tissue is infiltrated with chronic inflammatory cells.

3. Adenosis : Proliferation of glandular structure takes place with simple hyperplasia of the larger ducts and apocrine metaplasia of the smaller ductules.
4. Epithelial hyperplasia : Hyperplasia of epithelium which lines the ductal system with or without atypia.

### **III) BREAST CYST**

Breast cysts most commonly seen in the last decade of reproductive life due to non-integrated involution of stroma and epithelium. They are often multiple, may be bilateral and can mimic malignancy. Diagnosis is confirmed by aspiration and / or ultrasonography. Prompt diagnosis and drainage provides immediate relief. Recurrent cyst and persistents of solid element following aspiration needs excision biopsy to ruleout malignancy. Cysts from stromal system like lymphatic cyst & hydatid cyst are found very rarely.

### **IV) INFLAMMATORY BREAST DISEASES**

#### **A) ACUTE BACTERIAL MASTITIS**

It is the most common variety of mastitis and nearly always commences acutely. Although majority of cases occurs in association with lactation, it is not necessarily so.

#### **LACTATIONAL BREAST ABSCESS**

Most cases are caused by staphylococcus aureus 'cleaning the baby's mouth with a swab is also an aetiological factor. Mostly occurs during initiation of breast feeding. The common factors behind most of the case is obstruction of lactiferous ducts by epithelial debris leading to stasis. Once the organism enter producing clotting of milk and multiplication of organism occurs.

## **NON-LACTATIONAL BREAST ABSCESS**

The aetiology is different from lactational mastitis. It usually affects periareolar tissue, frequently recurs and the causative organism is a mixture of bacteroides, anaerobic streptococci and enterococci. Some of these cases will be associated with an infected haematoma or with periductal mastitis.

The affected breast, or more usually a segment of it, presents the classical signs of acute inflammation. In early stage it mimics a generalized cellulites, but later on abscess results.

**Antibioma** : If an antibiotic is used in the presence of undrained pus, an antibioma may form. It takes a long course to resolve.

## **B) MASTITIS FROM MILK ENGORGEMENT**

It is liable to occur around weaning time, and sometimes during initiation of breast feeding due to blockade of lactiferous duct with epithelial debris.

## **C) CHRONIC INTRAMAMMARY ABSCESS**

It follows inadequate drainage or injudicious antibiotic treatment and very difficult to diagnose this condition, if it is well encapsulated within thick wall of fibrous tissue. Treatment consists of local drainage with excision of capsule wall.

## **D) TUBERCULOSIS OF BREAST**

Astley Cooper first described this condition. It is comparatively rare, and is usually associated with active pulmonary tuberculosis or tuberculous cervical adenitis. Tuberculosis of breast is more common in parous women and presents with multiple chronic abscess and sinuses and attenuated surrounding skin. Sometimes the disease process leads to fibrosis with firm mass which mimics malignancy and hence biopsy is must. Treatment is with antituberculous chemotherapy. Healing is usual result although often delayed and rarely

lumpectomy may be needed for persistent residual lump

### **E) DUCT ECTASIA / PERIDUCTAL MASTITIS**

This condition is due to dilatation of the breast ducts associated with periductal inflammation and is more common in smokers.

The classical description of pathogenesis is a dilatation of one or more lactiferous duct that results in stasis of brown or greenish secretion leading to periductal mastitis or abscess and fistula formation. Fibrosis may cause slit like nipple retraction. A marked association between recurrent periductal mastitis and smoking has been proved and cessation of smoking increases the chance of long term cure.

Nipple discharge, a subareolar mass, abscess, mammary duct fistula or nipple retraction are usual presentations.

### **G) INFLAMMATORY MASTITIS IN PREGNANCY**

#### **Galactocele :**

Most cases occur in adult women during pregnancy but it may also occur in infants. It present as solitary or multiple circumscribed masses that may be unilateral or bilateral. The lesion average about 2 cm in diameter but may be 5 cm or more.

A galactocele is composed of cysts that contain fluid content resembling milk and are lined by smooth epithelium. Inspissated secretion may be present in the form of soft caseous material. The cyst appear to be formed as a result of duct dilatation.

### **H) OTHER INFLAMMATORY MASTITIS**

The other varieties of inflammatory mastitis like granulomatous lobular mastitis, mastitis associated with vasculitis, paraffinoma, silicone mastitis and other mastitis associated with breast augmentation and diabetic mastopathy are very rarely encountered.

## **V) TRAUMATIC BREAST DISORDERS**

### **A) FAT NECROSIS ;**

It may be acute or chronic and usually follows surgery, trauma or radiotherapy. It occurs most frequently in overweight women and in women with pendulous breasts. This condition mimic a carcinoma and excisional biopsy is required for diagnosis.

### **B) HAEMATOMA :**

Resolving haematoma, gives rise to a lump which is difficult to diagnose in the absence of overlying skin bruise, diagnosis is confirmed by aspiration or incision and evacuation.

## **VI) DISORDERS OF NIPPLE**

### **A) NIPPLE DISCHARGE**

Discharge can occur from one or more lactiferous ducts. Management depends on the presence of a lump and of the nature of discharge. In all cases carcinoma must be excluded.

#### **1) A clear, serous discharge :**

It is physiological in a parous women may be associated with mammary dysplasia or duct papilloma.

#### **2) A blood stained discharge :**

It may be due to duct ectasia or less commonly in duct papilloma or carcinoma.

#### **3) A black or greenish discharge**

It is usually due to duct ectasia and its complications.

### **B) NIPPLE RETRACTION**

This may occur at puberty or later in life. Pubertal nipple inversion is of unknown aetiology. It is bilateral in 25% of cases. It may cause problems with breast feeding. Treatment is usually unnecessary as it may spontaneously resolve during pregnancy or lactation.

### **C) CRACKED NIPPLE**

This may occur during lactation and is the fore-runner of acute infective mastitis. Treatment consists of rest to nipple for 24 to 48 hours and breast emptied with breast pump.

### **D) ECZEMA :**

Eczema of the nipples are a rare condition and is often bilateral and usually associated with eczema anywhere in the body. It is treated with 0.5% hydrocortisone.

## **E) CONGENITAL DISORDERS OF BREAST**

### **Amazia :**

Congenital absence of the breast may occur on one or both sides.

### **Polymazia :**

Accessory breast have been recorded in the axilla (more common site), groin, buttock and thigh. They have been known to function during lactation.

### **DIFFUSE HYPERTROPHY :**

It occurs sporadically in otherwise healthy girls at puberty and less commonly during first pregnancy. The breast attains enormous dimensions and is rarely unilateral. This is due to alteration in the normal sensitivity of the breast to oestrogenic hormones.

# INVESTIGATION OF BREAST DISEASES

An accurate history taking and clinical examination are very important methods of detecting breast diseases and also guide us in planning necessary investigation for a particular patient. The investigation should be ordered in such a way that it should be readily available, cost effective with maximum diagnostic accuracy.

## **Classification :**

### **A. *Non invasive methods :***

- a. Ultrasonography
- b. Mammography
- c. MRI

### **B. *Invasive Methods :***

- a. FNAC
- b. Tru Cut / Core needle Biopsy
- c. Excision Biopsy

## **A) NON INVASIVE METHODS**

### **1) ULTRASONOGRAPHY ( USG)**

- 1) It is particularly useful in young women with dense breasts in whom clinical and mammography are difficult to interpret the disease.
- 2) It is also useful to differentiate solid from cystic lesions.
- 3) It can also be used to localize impalpable areas of breasts pathology.
- 4) It is cost effective method but observer dependent and not useful as a screening tool.

### **2) MAMMOGRAPHY**

Although, mammography is the most sensitive and specific imaging test currently available, it is not routinely done for all non-neoplastic breast diseases and is not a substitute for biopsy.

**Principle :**

Soft tissue radiographs are taken by placing the breast in direct contact with ultrasensitive film using craniocaudal and mediolateral and exposing it to low voltage high amplitude X-rays.

The dose of radiation is 0.1 cGy and hence very safe method of investigation.

**Indications for Mammography are**

- 1) Doubtful small palpable lumps in the breast parenchyma
- 2) Chronic cystic mastitis with multiple nodularity in one or both breasts.
- 3) Patients with non palpable breast lesions presenting as nipple discharge, recent nipple retraction and axillary nodes to exclude malignancy.
- 4) Large breast with lesions that are difficult to palpate clinically.
- 5) Breast screening in high risk groups
- 6) If conservative breast surgery is planned in malignancy of breast.

The sensitivity of this investigation increases with age as the breast becomes less dense.

The disadvantage of mammography are its high cost and about 5% of breast malignancy may be missed by screening procedure.

**3) MRI :**

Magnetic Resonance Imaging (MRI) is useful in following clinical settings.

- 1) It is gold standard for imaging the breasts of women with implants.
- 2) It is useful to distinguish scar from recurrence of breast malignancy.

MRI is not used as a routine method of investigation for non-neoplastic breast diseases.

## **B) INVASIVE METHODS**

### **1) FINE NEEDLE ASPIRATION CYTOLOGY (FNAC)**

FNAC has now established itself as the first line of investigation in any palpable breast lesions. Now more studies have shown that FNAC is rapid, accurate, efficient, cost effective and safe method of diagnosing most neoplastic as well as non-neoplastic breast lesions.

Nowadays an accurate preoperative diagnosis is very important before subjecting any patient to mutilating breast surgeries.

FNAC has almost replaced frozen section histology and core needle biopsy in diagnosing most palpable breast lesions.

The present scope of FNAC are :

- 1) Specific diagnosis of benign and malignant breast lesions.
- 2) Accurate preoperative diagnosis of most palpable breast lesions thereby avoiding unnecessary surgeries.
- 3) Earlier diagnosis and planning for appropriate medical or surgical treatment.
- 4) Cost effective method of preoperative diagnosis.
- 5) Very helpful on rural and underdeveloped areas as it is easy to perform with few requirements.

### **TECHNIQUE OF FNAC**

The proper clinical examination of the patient is to be carried out in detail and the disease process must be localized and clearly defined. The case should be discussed with the pathologist before FNAC is being done regarding the feasibility and the likely informative value of FNAC in the particular case concerned.

## **EQUIPMENTS REQUIRED**

- 1) 22 gauge 0.6-1mm, external diameter disposable needles, 3.8cm to 8.8 cm long.
- 2) 10-20ml disposable plastic syringe.
- 3) “CAMECO” syringe pistol.
- 4) Microscopic glass slides with frosted ends.
- 5) Fixative : 70-90% ethanol in Koplins Jars.
- 6) Alcohol Sponges
- 7) Sterile gauze pads.
- 8) Sterile containers.
- 9) Skin disinfectants, watch glass, etc.

## **PREPARATION OF THE PATIENT :**

The planned procedure should be explained clearly and informed consent should be obtained. Selective positioning of the patient is must before the procedure. Preparation of local area with sterile swabs are done preliminarily.

### **Procedure :**

#### **Needle insertion :**

Better control over the needle is achieved by supporting the barrel of syringe by the forearm. Vertical approaches tend to be less painful and allows better appreciation of depth. If necessary, imaging techniques may be used to localize the lesion for favoring correct insertion of needle.

#### **Aspiration of Solid Breast Mass**

The mass is immobilized between the fingers and aspirated under negative pressure by a 22 gauge needle attached to a 10ml syringe. The needle needs to be moved through the

suspected mass in various directions. The retraction of the piston should be discontinued during withdrawal of the needle. The specimen obtained is placed between two previously alcohol – moistened, completely frosted glass slides, pressed, smeared and immediately fixed with isopropyl alcohol and stained by papanicolaou technique or haemotoxylin and eosin method.

## **2) TRU CUT / CORE NEEDLE BIOPSY :**

Large core needle biopsy is more invasive and painful than FNAC and needs local anaesthetic agent for performing this procedure and hence it is not done routinely for non-neoplastic breast lesions but in doubtful cases core biopsy obviates surgery.

## **3) EXCISION BIOPSY:**

It forms the final court of appeal for confirmation of all doubtful localized lesions and is resorted to whenever there is clinical, imaging and FNAC discordant findings were noted.

## ADVANTAGES AND DISADVANTAGES OF TECHNIQUES FOR ASSESSMENT OF BREAST LESIONS

Sl. No.	Technique	Advantages	Disadvantages
1)	Clinical	<ul style="list-style-type: none"> <li>○ Easy to perform</li> </ul>	<ul style="list-style-type: none"> <li>○ Low sensitivity in women aged &lt; 50 years.</li> </ul>
2)	USG	<ul style="list-style-type: none"> <li>○ Same sensitivity in all ages.</li> <li>○ Useful in assessing impalpable lesions.</li> <li>○ Painless.</li> </ul>	<ul style="list-style-type: none"> <li>○ Operator dependent</li> <li>○ No more sensitive than mammography.</li> </ul>
3)	Mammography	<ul style="list-style-type: none"> <li>○ Useful for screening women aged <math>\geq 50</math> years</li> </ul>	<ul style="list-style-type: none"> <li>○ Needs dedicated equipment and experienced personnel</li> <li>○ Low sensitivity in women aged <math>\leq 50</math> years unpleasant for patient.</li> </ul>
4)	FNAC	<ul style="list-style-type: none"> <li>○ Cheap</li> <li>○ High sensitivity</li> <li>○ Provides definitive diagnosis in most cases.</li> <li>○ Low false positivity</li> <li>○ Can be repeatable.</li> </ul>	<ul style="list-style-type: none"> <li>○ Operator dependent.</li> <li>○ Needs experienced cytopathologist for better interpretation.</li> </ul>
5)	Core Biopsy	<ul style="list-style-type: none"> <li>○ Easy to perform</li> <li>○ Higher sensitivity than FNAC</li> <li>○ Provides a definite histological diagnosis.</li> </ul>	<ul style="list-style-type: none"> <li>○ Operator dependent</li> <li>○ Uncomfortable</li> <li>○ Needs local anaesthesia.</li> </ul>

## **CYTOLOGY OF THE NORMAL BREAST**

### **A) NON-SECRETARY DUCT CELLS :**

Non secretory duct cells are cuboidal cells. They exfoliate in large numbers during pregnancy and lactation or after energetic breast massage. They are shed singly or more often, in tight clusters. The cytoplasm is more scanty and pale pink to blue or transparent. The nucleus is usually single, small, vesicular and regular in size with moderate variation in shape.

### **B) SECRETARY DUCT CELLS – FOAM CELLS :**

They are large cells with abundant ‘foamy’ cytoplasm and are found in large numbers during pregnancy, lactation, and acute or subacute mastitis. Multinucleation and considerable variation in cell size is common. If foam cells are present, the lesion is likely to be benign.

### **C) SQUAMOUS CELLS**

Anucleated or normal superficial squamous cells in varying amounts can be seen. Most of these cells are keratinized and have no specific significance.

### **D) HISTIOCYTES :**

Histiocytes appear irregularly. They are recognized by their typical bean shaped nuclei and debris or blood pigment containing cytoplasm. They are difficult to differentiate from foam cells if they have also ingested fatty debris and are most commonly found in the aspirated cyst fluid.

### **E) INFLAMMATORY CELLS :**

Varying numbers of inflammatory cells (polymorphonuclear leucocytes and lymphocytes) are always present. The amount increases prior to and just after delivery. Small amounts of fresh and old red blood cells that have no pathological significance may

occasionally be found. Because of the frequent co-existence of inflammation and breast carcinomas, an inflammatory smear should be screened for tumour cells with utmost care.

## CYTOLOGY OF NON-NEOPLASTIC BREAST DISEASES

### **A) ACUTE AND SUB-ACUTE MASTITIS**

Inflammation occurs more frequently during pregnancy, puerperium and lactation. It can be primary (e.g. trauma) or secondary to a systemic disease (e.g. Tuberculosis).

Large amounts of inflammatory cells, with a predominance of polymorphonuclear cells, are found on a thick background of cellular debris, microorganisms and protein precipitates.

#### ***Common Findings Are :***

- 1) A benign bimodal pattern
- 2) Inflammatory cells, chronic and / or acute
- 3) Regenerative epithelial atypia
- 4) Epithelioid histiocytes, multinucleated giant cells and many plasma cells  
(Granulomatous mastitis).

### **B) SUB AREOLAR ABSCESS**

There is mature or anucleated squamous cells in greater numbers may be due to contamination from skin.

### **C) PREGNANCY AND LACTATION**

When examining the aspirated material in pregnancy and lactation, especially in the third trimester, some of the criteria for malignancy are seen. The specimen has high cellularity, there is loss of adhesion of the cells which are larger than normal and pleomorphic. However, the uniformly round nuclei, and particularly the many lipid droplets seen in the background material are typical of lactation and benign.

FNAC of pregnancy is difficult to interpret, and unless full patient details are available a false positive report is a major threat. Surgical biopsy may rarely be needed in case of diagnostic dilemma.

#### **D) FIBROADENOSIS :**

In chronic cystic mastitis, numerous small foam cells and large metaplastic apocrine cells with acidophilic cytoplasm and dark pyknotic nuclei are present in the smears.

The back ground contains variable amounts of fresh and old red blood cells, cellular debris, and inflammatory cells.

#### ***Main Features Are :***

- 1) Apocrine epithelial cell sheets
- 2) Benign ductal epithelial cells, bare oval nuclei.
- 3) Background of macrophages.

#### **E) BREAST CYST :**

In many number of patients fine needle aspiration of the breast cyst 'Cures' the lesion. Breast lump disappears completely in more than 90% of patients and unnecessary surgical biopsy avoided. The typical cyst fluid is an opalescent grey or green colour.

#### ***The Criteria for diagnosis are :***

- 1) Complete disappearance of the lump following aspiration of the fluid.
- 2) Absence of blood in the aspirated fluid.
- 3) Debris, 'cyst macrophages' and oxyphill / apocrine epithelial cells.

In all cases of blood stained aspirate exclude malignancy.

#### **F) FAT NECROSIS :**

The aspirated material contains variable number of foam cells and elongated epithelioid

cells with dark nuclei and blood pigment containing or lipid containing phagocytes

***Criteria for diagnosis are :***

- 1) A background of granular debris, fat and fragments of adipose tissue.
- 2) Foamy macrophages, multinucleated giant cells and adipocytes with bubbly cytoplasm.
- 3) Chronic inflammatory cells
- 4) Absence of epithelial cells.

### **G) DUCT ECTASIA :**

Large amounts of debris, precipitate and lipid droplets obscure the smear with numerous lipid laden macrophages.

#### ***Criteria for diagnosis are :***

- 1) A thick, creamy or cheesy aspirate
- 2) Amorphous material and debris
- 3) Chronic inflammatory cells
- 4) Occasional monolayered sheets of uniform duct epithelium.

### **H) GALACTOCELE :**

The large numbers of foam cells on a background of abundant protein and lipid deposits is diagnostic. When slightly air dried, the back ground of smear has a honey comb pattern.

## MANAGEMENT OF NON-NEOPLASTIC BREAST DISEASES

### A) MASTALGIA :

After triple assessment of patients presenting with breast symptoms, of which dominant lump and malignancy have been excluded, the management is mainly conservative. Reassurance of the patient that the symptoms are not due to malignancy helps to relieve anxiety and breast symptoms in more than 80% of patients. All patients with mastalgia were advised to follow Cardiff breast symptom chart. Mechanical breast support, dietary advice like avoidance of Caffeine, low fat and high carbohydrate intake and discontinuation of patient on oral contraceptive pills.

The Cardiff breast pain symptom chart enables treatment response to be graded as follows :

- CBS I** : An excellent response leaving no residual pain.
- CBS II** : A substantial response leaving some residual pain  
but considered by the patient to be easily bearable.
- CBS III** : A poor response leaving substantial residual pain.
- CBS IV** : No response

Management of patients with mastalgia are as follows;

If after reassurance and dietary advice if CBS response is I & II patients were advised to continue the same treatment for 6 months.

If CBS response was III patients were reassured and given a trial of anti-inflammatory drugs. If CBS response was IV then one of the hormonal agent may be tried.

### CYCLICAL MASTALGIA :

Apart from reassurance either oral or topical anti-inflammatory drugs may be tried first.

**Evening Primrose Oil (EPO) :**

It forms first line of medical management. It is rich in polyunsaturated fatty acid and it corrects the essential fatty acid level to normality and there by relieves mastalgia. It has the least side effect profile of 2-4%.

**Hormonal Agents** are most popular methods if above measures fails.

**Danazol :**

It has got the best response rate of 68% with side effects of 32% and is best used in cyclic form to limit the adverse effects.

### **Bromocriptine :**

It has dopamine agonistic action and is useful in the management of cyclical mastalgia by decreasing the serum prolactin levels. Its use is also limited because of more adverse effects.

Excision of discretely localized tender areas also called as trigger spots shows about 20% failure rate. Surgical management must be avoided as it carry a danger of replacing the painful area to painful scar.

### **NON-CYCLICAL MASTALGIA :**

It is important to exclude extramammary causes such as chest wall pain. Non-cyclical mastalgia is usually not responsive to hormonal agents. Non-steroidal anti inflammatory agents may help in relieving the pain and it may be necessary to carryout a biopsy on a very localized tender area that might harbouring a subclinical cancer.

### **B) FIBRO CYSTIC DISEASE**

The diagnosis of fibrocystic disease is usually on clinical grounds that it is usually diffuse, bilateral and symmetrical in nature and more commonly seen in association with cyclical mastalgia.

Hence in all cases after confirmation of diagnosis by FNAC, a reassurance is must. Management of cyclical pain is as described above and for isolated, persistent lesions with clinical suspicion or producing patient anxiety inspite of adequate reassurance needs local surgical excision.

### **C) BREAST ABSCESS :**

During the cellulitic stage, the patient should be treated with an appropriate antibiotic like flucloxacillin or augmentin and the breast should be rested, with the feeding on the

opposite side breast only. The infected breast should be emptied with breast pump. Breast support, local heat and analgesia will help a lot.

If the above measures fails with continuous fever and severe breast pain, breast abscess must be thought and the presence of pus can be confirmed by needle aspiration and the pus analysed for the infection and cytology. Fluctuation is a late sign in breast abscess and hence incision and drainage must not be delayed until it appears, when in doubt ultrasound guides the site of abscess.

#### **Drainage of an intramammary abscess :**

The usual incision is sited in a radial direction over the affected segment and circum areolar incision is preferred if it allows adequate access to the affected area because of a better cosmetic result. The incision passes through the skin and the superficial fascia. A long haemostat is then inserted into the abscess cavity and all the loculi and septa are broken down using a finger tip. The wound may then be packed lightly with ribbon gauze or a drain inserted by counter incision in a dependent manner for better drainage.

#### **D) BREAST CYST**

Solitary simple cyst and small collection of cysts may be treated by needle aspiration under aseptic precautions and aspirated fluid noted for colour if blood stained malignancy must be excluded, if the aspirate is clear and the cyst completely disappears no further treatment is necessary but usually about 30% of the cysts recurs and needs formal cyst excision after complete evaluation.

#### **E) GALACTOCELE**

The usual site is central quadrant of the breast just behind the nipple areola complex. Needle aspiration is the treatment of choice. Aspiration produces thick and creamy fluid.

Surgery is reserved for those cysts which cannot be aspirated or super infected cysts.

#### **F) DUCT ECTASIA**

Antibiotic therapy with flucloxacillin and metronidazole may be tried and may results in cure in few patients however, surgery is often the only treatment option which cures most of these patients and consists of excision of all the major ducts (Had field's Operation)

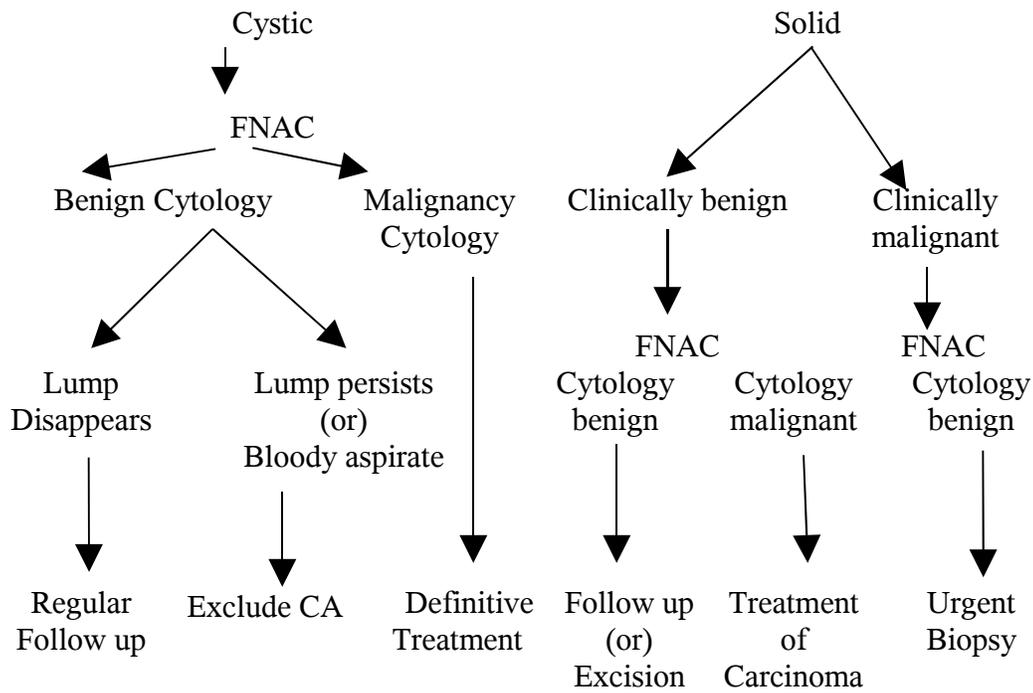
## DRUGS USED IN THE MANAGEMENT OF MASTALGIA

Sl. No.	Class of Drug	Mechanism of Action	Dosage	Side Effects	Incidence
1)	Diuretic	Reduction of Body water content	Thiazides daily	Metabolic disorders e.g. gout	Rare
2)	Progestogen	Correction of luteal phase defect	Medroxy progesterone acetate 20mg daily.	Pre menstrual symptoms, weight gain	20%
3)	Anti oestrogen	Correction of hyperestrogenism	Tamoxifen 10-20 mg daily	Hot flushes, weight gain, nausea, amenorrhoea	10%
4)	Dopamine agonist	Correction of hyperprolactinemia	Bromocriptine 2.5 mg bd daily	Nausea, dizziness, headache, postural hypotension	35%
5)	Antigonadotropin	Suppression of FSH and LH	Danazol 200-400 mg daily	Weight gain, acne, amenorrhoea, hirsutism	30%
6)	Essential fatty acid	Correction of EFA deficiency	Evening Primrose oil capsules 1000mg/ day	Nausea	4%

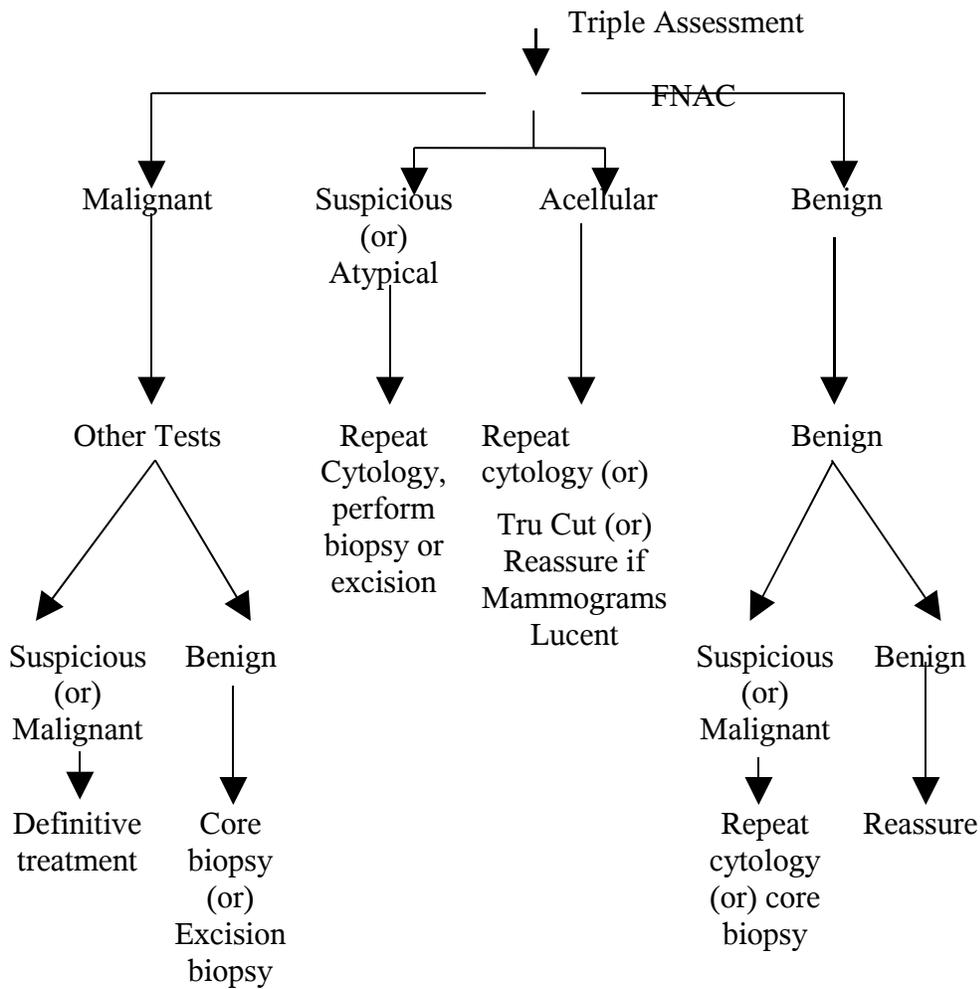
### RESPONSE OF CYCLICAL AND NON-CYCLICAL MASTALGIA TO MEDICAL MANAGEMENT

Sl.No.		Useful Response to treatment		
		Cyclical Mastalgia (%)	Non-cyclical Mastalgia (%)	Adverse Effects (%)
1)	EPO	42%	25%	3%
2)	Danazol	68%	29%	32%
3)	Bromocriptine	46%	22%	36%

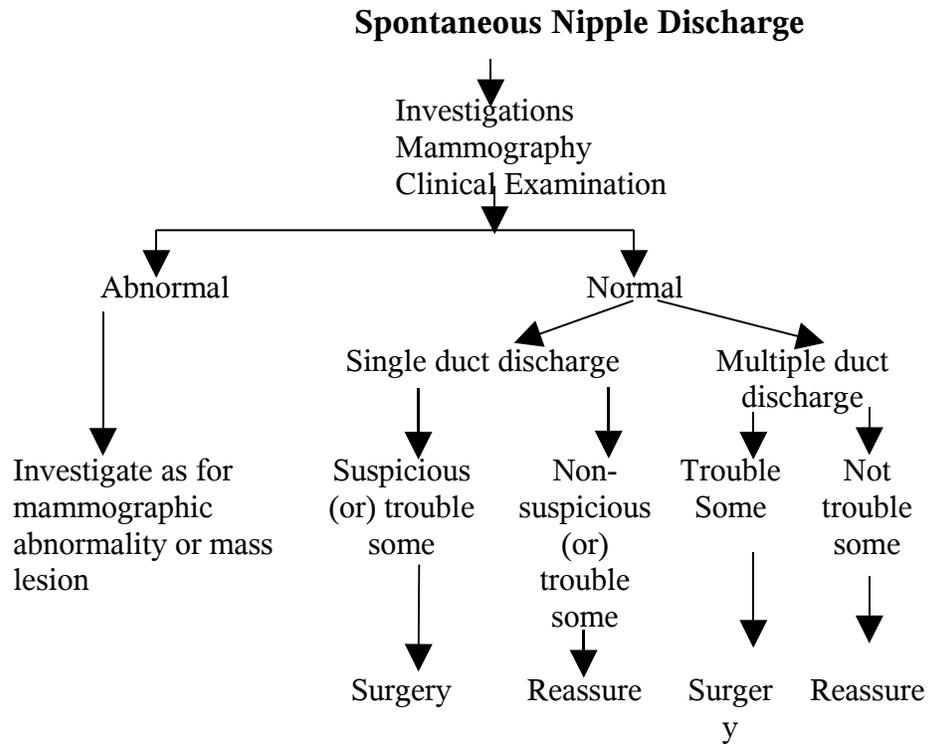
### FLOW CHART FOR INVESTIGATION OF BREAST LUMP



## EVALUATION OF BREAST LUMP



# EVALUATION OF NIPPLE DISCHARGE



## PATIENTS AND METHODS

This prospective analytical study on non neoplastic breast diseases was conducted between Feb. 2004 and Jan. 2006 for a period of 2 years. In our study a total number of 167 female patients who attended the out patient department, Stanley Medical College, Chennai with signs and symptoms of breast diseases were evaluated. Out of these 53 patients were excluded during initial period itself on clinical assessment of the patients with malignant and benign neoplastic diseases. Among the remaining 114 patients the study was carried out and finally 4 more patients were excluded from the study for reasons enumerated below :

- 2 patients diagnosed initially by FNAC as chronic breast abscess and breast cyst were proved to be malignant by final Histo Pathological Examination ( HPE ) report.
- Another 2 patients with final HPE report of fibroadenoma and duct papilloma (Benign neoplasms) were excluded.

Therefore finally our study consists of a total number of 110 female patients with confirmed non-neoplastic breast diseases with the exclusion of all malignant neoplasm and all benign neoplastic diseases like fibroadenoma (Common benign neoplasm), duct papilloma, phyllodes tumour, lipoma, etc.

A detailed history regarding the duration and nature of complaints, marital status, parity, lactational history, H/o. oral contraceptive pill intake, menstrual history, relation of breast symptoms with menstruation and family history were recorded as per proforma.

All patients were subjected to complete clinical examination and 87 patients were

subjected to FNAC. USG and mammography were used only in selected patients with diagnostic doubtfulness.

Since mammography is not available in our hospital, it was offered only to those affordable patients with doubtful diagnosis on clinical, USG and FNAC analysis at their own cost.

We analysed the incidence, age distribution, clinical features like quadrant involved, axillary node involvement, nipple discharge etc. with special focus on the usefulness of FNAC in non-neoplastic breast diseases.

After triple assessment of all patients with breast lesions if the diagnosis is still inconclusive they were subjected to excision biopsy for final proof of diagnosis and planning further treatment if necessary.

## **OBSERVATIONS AND RESULTS**

Among the total number of 110 patients with non-neoplastic breast diseases, the incidence of various diseases are as follows :

**Table 1**  
**Incidence of Non-neoplastic Breast Diseases**

<b>Sl.No.</b>	<b>Non-Neoplastic Breast Diseases</b>	<b>Number of Patients</b>	<b>Percentage (%)</b>
1)	Fibrocystic Disease	59	53.6%
2)	Mastalgia	27	24.5%
3)	Acute abscess	12	11%
4)	Chronic abscess	5	4.5%
5)	Breast cyst	2	1.8%

6)	Tuberculous Mastitis	1	0.9%
7)	Galactocele	1	0.9%
8)	Haematoma	1	0.9%
9)	Duct Ectasia	1	0.9%
10)	Sebaceous Cyst	1	0.9%

### **A) AGE DISTRIBUTION**

The lowest age in our study was 18 and the highest age was 55. Majority of the patients with fibrocystic disease comes under average socioeconomic status and patients with inflammatory breast diseases comes under low socioeconomic status.

**Table - 2**  
**AGEWISE FREQUENCY DISTRIBUTION OF NON-NEOPLASTIC BREAST DISEASES**

<b>Sl.No.</b>	<b>Age Group (in years)</b>	<b>NO. of Patients.</b>
1)	15-20	14
2)	21-25	16
3)	26-30	24
4)	31-35	19
5)	36-40	18
6)	41-45	11
7)	> 45	8
	Total	110.

### **B) MENSTRUAL STATUS**

Menstrual periods, amount of flow were found to be near normal in most of the patients with the exception of 21 patients in whom the flow was moderately increased. Most of these

patients belong to younger age group between 18 to 25 years. In about 33 out of 59 patients with fibrocystic breast disease and 19 out of 27 patients with mastalgia premenstrual breast symptoms were noticed.

### **C) MARITAL STATUS**

Among the 110 patients with non-neoplastic breast diseases 21 patients were unmarried. Most of the patients with fibrocystic disease were married. The actual marital period varied from 4 months to 34 years.

Among the inflammatory breast diseases 2 out of 12 acute breast abscess were unmarried and the marital period varied from 2 months to 21 years.

### **D) PARITY :**

89 out of 110 patients belonged to married group. 5 patients were nulliparous and 2 patients had H/o abortion at 1<sup>st</sup> trimester. All other patients had children. 4 out of 5 Nulliparous patients had fibrocystic breast disease in our study and this had been a significant finding.

### **E) LACTATION**

All patients who had children were found to have lactated their children. The period of lactation varied from 5 months to 18 months. 4 out of 12 patients with acute breast abscesses were lactating at the time of presenting the disease i.e. about 33% and they were encouraged to breast feed in opposite breast giving rest to the affected breast.

### **F) FAMILY HISTORY**

In 3 out of 59 patients with fibrocystic disease family history of similar complaints were noticed. In all the rest of the patients family history was not significant.

## G) ORAL CONTRACEPTIVE PILL INTAKE

2 out of 110 patients with non neoplastic breast diseases gave H/o OCP intake, among which one patient belonged to fibrocystic breast disease group and the other patient belonged to mastalgia group.

## H) CLINICAL PRESENTATION :

### 1) Presenting Symptom :

Most patients presented with lump in the breast, pain or both.

In our study, the presenting symptoms were tabulated as follows

**Table – 3**

<b>Sl.No.</b>	<b>Presenting Symptoms</b>	<b>No. of Patients</b>	<b>Percentage (%)</b>
1)	Lump alone	51	46.4%
2)	Pain alone	29	26.4%
3)	Lump and pain	25	22.7%
4)	Nipple discharge	4	3.6%
5)	Skin tethering	1	0.9%

Among the fibrocystic disease more than 50% of patients complained of cyclical mastalgia and vague tenderness in one or both breasts during menstrual periods.

Out of 59 patients with fibrocystic disease 30 patients presented with bilateral disease, 18 patients with left sided disease and 11 patients presented with right sided disease. All patients presented with pain alone were treated conservatively.

Nipple discharge was noticed in 4 patients , among which 2 patients with serous discharge belong to fibro cystic diseases. One patient with milk discharge was a case of

galactocele and the other patient with greenish black discharge was a case of duct ectasia.

Skin tethering mimicking carcinoma of breast was noticed in one patient with chronic breast abscess.

## 2) Quadrant Involved

In fibrocystic disease and inflammatory breast diseases upper outer quadrant was most commonly involved and lower inner quadrant was least commonly involved.

**Table - 4**

<b>Sl.No.</b>	<b>Quadrant</b>	<b>Fibrocystic Disease (%)</b>	<b>Inflammatory Breast diseases (%)</b>
1)	Upper Outer	44%	42%
2)	Upper Inner	29%	26%
3)	Lower Outer	17%	21%
4)	Lower Inner.	10%	11%

## **TRIPLE ASSESSMENT OF NON-NEOPLASTIC BREAST DISEASES :**

### **1) FNAC**

Total number of patients taken up initially for our study were 114. Of this only 87 patients were subjected to FNAC and the rest of the 27 patients with mastalgia were diagnosed and treated on clinical grounds.

Among the 87 patients subjected to FNAC, 5 cases reported as inconclusive and hence repeat FNAC was carried out and 3 slides reported as non-neoplastic and the remaining 2

patients underwent core needle biopsy and were diagnosed as TB mastitis and chronic breast abscess.

Among the remaining 82 patients FNAC in 5 cases were reported as normal breast cytology. But as per the clinical features excision biopsy was carried out in them and 3 cases were reported as fibroadenosis and one case reported as duct ectasia and the other one as chronic breast abscess.

Excision biopsy was carried out in 38 out of 87 patients who underwent FNAC for persistent or doubtful lesion in triple assessment and the HPE reports were summarized as follows :

Distribution of breast diseases in 34 patients with non neoplastic lesions .

**Table - 5**

<b>Type of Disease</b>	<b>HPE Proven</b>	<b>FNAC Result</b>
Fibroadenosis	25	22
Chronic breast abscess	5	4
Breast Cyst	2	2
Duct Ectasia	1	0
Sebacious Cyst	1	1
Total	34	29

**Note :**

2 patients with HPE reported as malignancy and 2 more patients with HPE reported as benign neoplasms were excluded from the study.

In our study, the over all diagnostic accuracy of FNAC in non-neoplastic breast diseases was 85.3% and false negative rate was 14.7%.

FNAC was 100% accurate in picking up acute breast abscesses, breast cyst and sebaceous cyst.

It was 88% accurate in diagnosing fibroadenosis and 80% accurate in diagnosing chronic breast abscess and not able to diagnose duct ectasia and TB mastitis.

**2) Tru Cut / Core biopsy** was done in 2 patients where FNAC was inconclusive. One was a case of tuberculosis of breast and the other one was a case of chronic breast abscess.

**3) USG and Mammography** were performed in about 17 and 6 patients respectively with clinical and FNAC disagreement.

USG was very good in picking up acute breast abscesses and breast cysts.

Mammography was very useful in differentiating benign and malignant breast lesions.

Among the **triple assessment** of non-neoplastic breast diseases.

- a) Clinical examination was sufficient in diagnosis of most patients with mastalgia and fibrocystic diseases .
- b) FNAC ranks 1<sup>st</sup> in the diagnosis among the available investigatory modalities in triple assessment.
- c) Core biopsy has higher sensitivity and diagnostic accuracy than FNAC and hence can be selected appropriately in FNAC inconclusive patients.
- d) USG and Mammogram are very useful ancillary tools in arriving at a confirmatory diagnosis significantly improves the diagnostic accuracy and helps in excluding malignancy.

## REVIEW OF LITERATURE

- 1) Hughes et al (1991) reported in his study that 85% of all breast lumps are benign. Most benign can actually be regarded as aberrations of normal processes.
- 2) Sohn et al (1999) concluded in his study that fibrocystic change is the most common benign disorder and affects 40-50% of pre-menopausal women.
- 3) Tavassoli et al (1992) reported that fibrocystic disease as a unified term for several proliferative, but non-neoplastic parenchymal alterations, which are usually bilateral and multifocal.
- 4) Bartow et al (1982) reported that breast cyst remain an important clinical problem because of their presentation as mass lesions and their varied histopathological and biochemical components merit further study. Fibrocystic disease is usually bilateral and frequently involves upper outer quadrant with associated pain and tenderness.
- 5) Friedenreich et al study suggested that fibroglandular tissue density may be a risk factor, or marker for increased risk of benign proliferative breast diseases.
- 6) Gordon et al, (1993), Saarela et al (1996), Ciatto et al (1997), Pisano et al (1998) and Chaiwun B et al (2002) all reported that FNAC is most cost effective, easy to perform and involves minor complications. In qualified hands it decreases the need for surgical biopsies and the reported the diagnostic accuracies from 81% - 98%.
- 7) Kreula et al (1990) reported that the number of insufficient samples can be reduced by an experienced radiologist using a proper puncture and aspiration technique.
- 8) Ben Hassouna J, Gamoudi A et al (2001) in his article on mammary tuberculosis concluded that clinical and radiological features of mammary tuberculosis are very confusing and

cause a diagnostic problem with breast cancers and biopsies must be done to eliminate cancer.

9) Shrotria S et al, (2001), reported that the periareolar incision provides a good cosmesis in both benign and early malignant breast surgeries.

10) Tewari M, Shukla HS et al Indian Journal of Surgery, 2005 in his article on Breast tuberculosis reported that the diagnosis is based on histology and TB bacilli in microscopy or culture and ATT treatment for 6 months with or without minimal surgery forms the mainstay of treatment.

## **DISCUSSION**

### **A) FIBROCYSTIC DISEASE (FIBROADENOSIS) OF BREAST**

The diagnosis of fibrocystic disease is usually done by complete history taking and clinical examination, and confirmation of diagnosis is made by FNAC (in most occasions) and the management rests mainly on reassurance of the patient that the symptoms are not due to malignancy and only few patients with localized area of persistent lump, persistent severe pain with lump and doubtful diagnosis needs surgical excision.

The lump associated with nodularity is a common presentation identified with or without premenstrual symptoms and is more commonly seen during reproductive period more so during pre-menopausal period.

Fibroadenosis is usually a bilateral disease with predominant involvement of upper outer quadrant.

Symmetrical distribution is best appreciated by palpating both breasts simultaneously from standing behind the patient. This technique is more useful in assessing doubtful lumps in fibrocystic disease.

The diffuse nature of the lesion and associated with cyclical pain indicates conservative management but whenever there is a dominant lump or persistent doubtful lesions needs complete evaluation. FNAB is must for confirmation of all palpable breast lesions, and negative cytology and mammography is not sufficient evidence to ignore a dominant palpable lesion and needs core biopsy or surgical excision to exclude malignancy.

In our study the peak incidence of fibrocystic disease was found to be between 25-40 years.

Various case control studies have established that the age at menarche, nulliparity and age at 1<sup>st</sup> childbirth did not significantly affect the risk of fibrocystic disease. But in our study it was found that there was a positive correlation between nulliparity and fibroadenosis and almost all patients with fibroadenosis were got married.

According to Maddox et al, when nodularity was present in fibrocystic disease it takes preponderance to upper and outer quadrant similarly in our study also the most of the patients with fibroadenosis involve upper and outer quadrant and this may be explained by the fact that there is excess breast tissue in outer half.

Fibrocystic disease is said to occur commonly bilaterally and symmetrical, in our study also 30 out of 59 patents had bilateral and symmetrical lesions and among the rest of the patient fibroadenosis is more common in (L) breast compared to right side.

In various case control studies which has examined oral pills usage it was found to have a reduction in the risk of fibrocystic disease and in our study only one patient with fibroadenosis give history of OCP intake in the near past.

It is said that it is difficult to obtain a cellular smear by needle aspiration in patients with diffuse nature of fibrocystic disease in such cases it is better to take FNAC under USG guidance or where there is more nodularity of breast tissue.

Once fibrocystic disease had been confirmed by FNAC the management is mainly conservative in more than 50% of patients.

If pain was the most serious symptom and cyclical in nature then the treatment was still be conservative with specific drugs as used in the management of cyclical mastalgia.

In our study about 59 out of 110 cases were diagnosed as fibrocystic disease among which 34 cases were treated conservatively by reassurance and drug treatment in case of

associated cyclical mastalgia,. The remaining 25 cases were opted for excision biopsy for reasons as mentioned above and HPE reports were analyzed.

## B) INFLAMMATORY BREAST DISEASES

### 1) Acute Mastitis

Acute mastitis due to bacterial infection forms the most common type of mastitis and it is commonly seen in association with lactation. Among the non-lactational group mastitis due to infected haematoma or periductal mastitis are most important causes.

Most cases of lactational mastitis are caused by staphylococcus aureus entering through abraded or cracked nipple. Management consists of appropriate antibiotics and rest to the breast, if not responding think of breast abscess and management consist of needle aspiration followed by incision and drainage as discussed in detail in management of breast abscess.

According to Berna – Serna JD et al (2004) percutaneous needle aspiration under USG guidance with strict aseptic conditions cures most small breast abscesses. Large abscesses needs formal incision and drainage and chronic abscesses is need surgical excision but in our study we followed incision and drainage in all acute abscesses with use of radial incisions in 8 out of 12 cases and circumareolar incisions in 4 out of 12 cases and the later circumareolar incisions were cosmetically superior to radial incisions.

### 2) Chronic Abscess :

It usually follows inadequate drainage or injudicious antibiotic treatment and is often a very difficult condition to diagnose and when encapsulated with thick fibrous wall, the condition cannot be distinguished from a malignancy and needs excision biopsy.

In our study we had 5 patients with chronic breast abscesses and in 4 cases FNAC was enough to confirm the diagnosis and in 1 patient where FNAC was normal still the patient

operated for persistent lump and HPE report came as chronic breast abscess. Excision were done via circumareolar incision and the results were cosmetically good.

### **3) TUBERCULOUS MASTITIS**

Tuberculosis of the breast is comparatively rare and is usually associated with active pulmonary tuberculosis or tuberculous cervical adenitis.

In our study also one patient presented with cervical adenitis with vague breast lump, repeated FNAC done were inconclusive and the patient was proceeded with core needle biopsy and the HPE report came as tuberculous mastitis and the FNAC of cervical node also positive for tuberculosis and that patient was treated with full course of ATT and the lump disappeared after completion of ATT and the patient went home well.

### **4) DUCT ECTASIA (OR) PERIDUCTAL MASTITIS**

It is a non-neoplastic disease of unknown etiology in which duct dilatation is a major feature along with periductal inflammation.

Plasma cells are frequently found in the chronic inflammatory cell infiltrate hence also called as plasma cell mastitis. Once major duct get blocked and infected it present as subareolar abscess.

In our study one case presented with greenish black discharge, subareolar lump and was suspected as duct ectasia but the FNAC report came as normal even than we went ahead with excision of all the major ducts (Had field's operation) and the HPE report confirmed it as duct ectasia.

### **NIPPLE DISCHARGE**

In most non-lactating female patients small amount of nipple discharge is common with negative pressure.

In Haagensen's Series

Primary nipple discharge is seen in 4.8% of patients.

In Edinburgh Series with Nipple Discharge

Duct ectasia : 27%

Duct Papilloma : 10%

Duct Carcinoma : 5%

Galactorrhoea : 3%

No Abnormality : 33%

**In our present study :**

Nipple discharge is seen in 4 out of 110 patients.

Fibrocystic disease (Serous discharge) : 2 patients ( 1.8%)

Galactocele (Milky discharge) : 1 patient ( 0.9%)

Duct ectasia (Greenish black discharge) : 1 patient ( 0.9%)

**GALACTOCELE :**

It is a rare condition presents as a solitary, subareolar cyst and always dates from lactation. It contains milk and in long standing cases its wall tend to calcify and may attains huge size.

In our study we had a interesting case of Galactocele presented with persistent milky discharge with associated subareolar abscess and was successfully managed with needle aspiration of Galactocele and incision and drainage for subareolar abscess and cessation of lactation as she had 1½ years child.

**USEFULLNESS OF FNAC IN TRIPLE ASSESSMENT OF BREAST**

FNAC is universally accepted technique nowadays, and more so in case of palpable breast lesions. Its contribution is more compared to other investigatory procedures.

Core needle biopsy has an advantage over FNAC in that the core of tissue obtained can be processed for histological examination, but demands considerable skill in their execution and may damage the breast tissue. Haemorrhage and sepsis or not uncommon complications. Moreover satisfactory samples cannot be obtained from lesions less than 3cm in diameters and a reliable diagnosis can be made only in 75% of cases.

FNAC is quick and easy to perform. The cytologists can give a report on fine needle aspirate within minutes. FNAC of all palpable lesion is easier one, but the non-palpable lesions can be biopsed by USG or mammography guidance. FNAC combined with USG or mammography has the benefit of reducing unnecessary surgery for non-neoplastic breast lesions.

In FNAC there are certain conditions in which a false positive diagnosis may be made. In typical epithelial hyperplasia large atypical nuclei may raise suspicion of malignancy, but the presence of single bare nuclei of benign type exclude malignancy. In pregnancy and lactation smear may resemble malignant, but lipid secretion in back ground prevent this diagnosis.

In certain conditions there is risk of making a false negative diagnosis. FNAC of non-neoplastic breast lesions like fibrocystic disease, duct ectasia and chronic breast abscess, etc. some time gives false negative results (i.e. FNAC may be normal).

In our study we have used 22-23 gauge disposable needles with 10ml disposable syringes. Use of needle smaller than 22 gauge may produce an inadequate number of cells.

In all cases the procedure was performed without anaesthesia. Mild pain along the

puncture site was the only complaint from the patients.

In our study only 87 out of 114 cases were taken up for FNAC and the remaining 27 cases of mastalgia group were diagnosed on clinical grounds alone.

Histo-pathological examination (HPE) reports were available for only 38 out of 87 patients who underwent excision biopsy and all other patients with fibrocystic disease were treated conservatively and all acute breast abscesses were treated by incision and drainage.

Cases	No. of Patients
Total number of cases taken up for the study	114
Total cases for whom FNAC was undertaken	87
Among (87 cases) which number of cases treated conservatively or by I&D	49
Total cases for whom excision biopsy undertaken and HPE reports available	38
HPE reported as Non-neoplastic	34
HPE reported as Neoplastic (both benign and malignant)	04

**The diagnostic accuracy of FNAC in non-neoplastic breast diseases was 85.3% with false negative rate of 14.7%.**

Series	No. of cases with HPE reported as non-neoplastic lesions	No. of cases with FNAC reported as non-neoplastic lesions	FNAC	
			Diagnostic Accuracy	False Negative rate
Present Study	34	29	85.3%	14.7%

When compared to other series, our study had a little higher false negative rate in diagnosing non-neoplastic breast lesions probably due to the misplacement of needle during FNAC.

Clinical usefulness of FNAC is well demonstrated in the diagnosis and management of non

neoplastic breast diseases and may be summarised as follows :

- 1) FNAC forms the 1<sup>st</sup> line of investigation for confirmation of all non-neoplastic breast diseases with palpable lesions.
- 2) In non-palpable breast lesions, USG or mammogram guided FNAC is very much useful.
- 3) FNAC guides us in avoiding unnecessary mutilating surgery if proved as non-neoplastic lesion as most cases needs conservative treatment only.
- 4) A cystic lump should be aspirated totally, if it recurs following repeated aspirations or blood stained aspirate or with residual lump following aspiration needs excision to exclude malignancy.

#### **DISADVANTAGES OF FNAC :**

FNAC has got a high false negative rate in non-neoplastic breast lesions and may likely to miss few malignant and benign neoplasms as well. In our study we had a significant false negative diagnosis of neoplastic breast diseases to the range of 3.5 %. It can be minimized by triple assessment of doubtful cases and USG or mammogram guided FNAC or core biopsy in selected cases.

## CONCLUSION

- Our study has shown that non-neoplastic breast diseases forms an important primary disorders of women in their reproductive period and it comprises more than 50% of all benign breast diseases.
- Fibrocystic disease is most common among the non-neoplastic breast diseases and is a disease of pre-menopausal women of average socio economic status.
- Fibrocystic disease is commonly bilateral and symmetrical and has got significant relationship with nulliparity in our study.
- Lump and mastalgia are the common presenting complaints and the left upper outer quadrant being commonly involved
- Fibrocystic diseases were best managed by conservative line of treatment and in patients with persistent localized lump and doubtful diagnosis needs surgical excision
- OCP intake and family history have no significant relationship with non-neoplastic breast diseases.
- Inflammatory breast diseases are commonly a disease of younger women and low socioeconomic status.
- Lactation was found to be an important factor associated with acute inflammatory breast lesions.

- The presenting symptom in these group are painful breast lump either localized or diffuse with fever in all acute cases and sometime mimic malignancy.
- All acute abscesses were best managed by incision and drainage via radial or circumareolar incision.
- All choronic abscesses were managed by excision via circumareolar skin incision.
- The circumareolar skin incision results were cosmetically superior to radial incision.
- Tuberculous mastitis, although rare it should be kept in mind and best treated by antituberculous treatment and rarely needs surgical excision if any for residual lump occurs.
- Triple assessment of breast is necessary to diagnose the breast lesion, to exclude malignancy and to avoid unnecessary surgery.
- Among the triple assessment FNAC serves as a safe, easy and most useful frontline investigation with high diagnostic accuracy in non-neoplastic breast lesions.
- In our study the diagnostic accuracy of FNAC was 85.3% and false negative rate was 14.7%.
- FNAC had its own demerit of missing out 3.5% of neoplastic (benign and malignant) breast diseases in our study.
- USG and mammography are ancillary tools to FNAC and clinical evaluation and improves diagnostic accuracy and decreases false negative rate

- Histological proof prior to definite surgical treatment should be made whenever there is clinical and FNAC disagreement.
- Excision biopsy has emerged as the investigation of choice in doubtful clinical presentation where other investigatory modalities failed.

## BIBLIOGRAPHY

- 1) ASI Text Book of Surgery, 1<sup>st</sup> Edition, 2003, 26 : 667-99.
- 2) Atlas of diagnostic cytopathology, 2<sup>nd</sup> Edition, 2003, 8, 357-63.
- 3) Bailey and Love short practice of Surgery 24<sup>th</sup> edition, 2004, 55. 824-34.
- 4) Berna – Serna JD, Madgrigal M et al, Percutaneous Management of Breast Abscess, Ultrasound Med. Bio 2004, Jan; 30(1), 1-6, related articles, links.
- 5) Ben Hassouna J, Gamoudi A et al, Mammary Tuberculosis,. Institute of Salah Azaiez, Tunisie, related articles in French, links.
- 6) Bartow SA, Pathak et al, Prevalence Benign, atypical and malignant breast lesions in populations at different risk for breast cancer. 60: 2751, 1987.
- 7) Bishop HM, Blamey RW 1979. A suggested classification of Breast Pain. Post Gr. Medical Jr. 53, (59-60).
- 8) Bright RA, Morrison AS. et al. Histological and mammographic specificity of risk factors for benign breast disease, 64: 653, 1989.
- 9) Chaiwan B et al, Diagnost Cytopathol, Effectiveness of FNAC of breast : Department of Pathology, Faculty of Medicine, Chiang Mai University, Thailand, 2002, Mar; 26(3) : 201-5, Related articles, Links.
- 10) Chummy S. Sinnatamby, Last's Anatomy, 10<sup>th</sup> Edition, 2001, 4: 54-55.
- 11) David Sutton, Text Book of Radiology and Imaging, 6<sup>th</sup> Edition, 1999, 53, 1429-58.
- 12) Dehn TCB, Clart J. et al. FNAC with immediate reporting in the outpatient diagnosis of breast disease. Annals of Royal College of Surgeons of England, 1987, 69: 280-82.

- 13)Devitl JE et al, Benign disorders of the breast in older women surg. Gynecol. Obst. 162 : 340, 1986.
- 14)Dixon JM, Mansel RE et al, 1994 ; Symptoms assessment and guidelines for referral. BMJ, 309 : 722- 26.
- 15)Edward J. Willinson MD and Kirby I Blend M.D et al, Techniques and results of aspiration cytology for diagnosis of benign and malignant disease of breast, surgery clinic NA 70; 4C 801-15.
- 16)Eryilmaz R & Sahin M et al, Management of Lactational breast abscesses, department of surgery, Vakif Gureba Training Hospital, Istabul, Turkey, related articles and Links.
- 17)Essential Surgical Practice, A Cuschieri 4<sup>th</sup> Edition.2002, 3: 61-68.
- 18)Farquharson, Text book of operative surgery, 1995, 13: 323-34.
- 19)Friedenreich et al, Risk Factors for benign proliferative breast disease, International Journal of Epidemiology, 2000, 29 : 637-44.
- 20)Goodson et al. Three year followup of benign FNAB of the breast, Americal Journal of Surgery, 1987; 154 : 58-61.
- 21)Gray's Anatomy, 38<sup>th</sup> Edition, 1995, 5 : 417 – 24.
- 22)Haagensen CD, Diseases of breast, 1980, 3<sup>rd</sup> Edition.
- 23)Hughes LE Mansel RE, Webster DJJ< Aberration of normal development and involution, lancet, 1987, 2: 1316.
- 24)J. Report Med, Department of Gynecology, Obstetrics, State University of New York at Buffalo, USA, 2005, Dec; 50(12) : 933-9. Related articles, Links.
- 25)Maddon PR et al. Non-cyclic mastalgia, classification and treatment, British Journal of Surgery, 1989, 76.

- 26) Nicholson S. et al. Use of FNAC with immediate reporting in diagnosis of breast disease, British journal of surgery, 1988, 75 : 847.-850.
- 27) Oxford Text Book of Surgery, 2<sup>nd</sup> edition, 2000, Vol.2, 21 : 1169-90.
- 28) Oxford Text Book of Pathology, 1992, Vol. 2, 22, 1644-80.
- 29) Palli D, Del Turco MR, Somorini R, et al. Benign breast disease and breast cancer : A case control study in a cohort in Italy, Int. J. cancer, 1991 : 47-941.
- 30) Robbins, Cotran & Kumar, Pathologic basis of disease.
- 31) Sabiston, Text Book of Surgery, 17<sup>th</sup> Edition, 2000, Vol.1, 32, 867-89.
- 32) Sandhya P Iyer #, M.A. Gore ##, Dept. of Surgery, LTM GH and Medical College, Sion, Mumbai. Epidemiology of Benign Breast Diseases in Females of Child bearing age group.
- 33) Shrotria S, Eur J. Surg. Oncol.. The periareolar incision – gateway to the breast, Ashford, Hospital, Middlesex, UK, 2001, Sep; 27(6) : 601-3. Related Articles, Links.
- 34) Sternberg's Diagnostic Surgical Pathology, 4<sup>th</sup> Edition, 2004, 9, 323-340.
- 35) Tewari M, Shukla HS et al, Indian J. Med. Res, Breast Tuberculosis : Diagnosis, Clinical features and management 2005, Aug; 122(2) : 103-10. Related Articles, Links.

