FINE NEEDLE ASPIRATION CYTOLOGY TRUCUT BIOPSY AND HISTOPATHOLOGICAL EXAMINATION IN BREAST LUMPS – A Comparative Evaluation

Dissertation Submitted
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COIMBATORE MEDICAL COLLEGE

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CERTIFICATE

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DECLARATION

I solemnly declare that this Dissertation on **"FINE NEEDLE ASPIRATION CYTOLOGY, TRUCUT BIOPSY AND HISTOPATHOLOGICAL EXAMINATION IN BREAST LUMPS – A COMPARATIVE EVALUATION"** was done by me at Coimbatore Medical College Hospital, Coimbatore under the guidance and supervision of **Dr.B.Easwaran, M.S.**

Place:

Date: **DR.S.SUJITH KUMAR**

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CONTENTS

ABBREVIATIONS

ABC	-	Aspiration Biopsy Cytology
Acc	-	Accuracy
Ca	-	Carcinoma
CT	-	Computed Tomography
DNA	-	Deoxyribonucleic acid
EM	-	Electron Microscopy
FNAC	-	Fine Needle Aspiration Cytology
HPE	-	Histo Pathological Examination
MHZ	-	Mega Hertz
MRM	-	Modified Radical Mastectomy
N/C	-	Nucleo Cutoplasmic ratio
®	-	Right
(L)	-	Left
Sen	-	Sensitivity
Spe	-	Specificity
TCNB	-	Trucut Needle Biopsy
USG	-	Ultra sonogram

INTRODUCTION

A lump in the breast whether benign or malignant results in anxiety for the patient and her family and the surgeon. Histological tissue diagnosis is a universly accepted means of definitive diagnosis.

Fine Needle Aspiration Cytology (FNAC) is gaining a wide acceptance as it gives a rapid diagnosis and can be carried out in out patient services.

The trucut needle is a very handy instrument and it is almost replacing the incision or excision biopsy in the breast lump, as it can be carried out in the out patient services with minimal trauma.

In this study 65 patients having breast lumps, were subjected to FNAC and Trucut Needle Biopsy as out patients and followed by operative treatment with a histological diagnosis, which were compared with tissue diagnosis (HPE).

REVIEW OF LITERATURE

The clinical tissue cytology or non exfoliative cytology defined by Banforth in 1966 as follows. "The examination of cells obtained by needle or drill biopsy in solid organs or tissue masses or from cut surface of such material freshly removed by surgical biopsy".

The present day definition as given by S.Kline is that

"Fine needle aspiration cytology is the study of cells obtained by small gauge Needle generally with vacuum system provided by an air tight syringe".

Initially clinical evidence was preferred to biopsy. If a lump ulcerated, it was cancerous. In 1801, Adams[2] observation on the used excision biopsy and macroscopy. Both Paget[31] and Erichsen[13] were pioneer in tumour microscopy and published cytological illustration. The need for biopsy was recognized and emphasized by Laurence[26] in 1855 stating the instance where a breast was amputated for a supposed tumour which turned out after the operation to be only a chronic abscess.

The necessity for the histological confirmation of the diagnosis before contemplating complex and often distinguishing or mutilating surgery cannot be over emphasized. Thus developed surgery cannot

be over emphasized. Thus developed the preoperative diagnostic procedures like frozen section and imprint smear cytology, or preoperative biopsy which should be simple, not distinguishing and carried out in the out patient department. The technique of "TRUCUT" Needle biopsy and fine needle aspiration cytology followed.

Investigation of a tumour by means of a needle was carried out in St.Bartholomew's Hospital in 1833 for a case of abscess of the liver with Hydatid cyst. The patient improved after this. Needle biopsy became established method of diagnosing a collection of pus.

Needle biopsy was first recorded by KUN[25] in 1841 and was adopted by others.

Erichsen in 1853 described as exploring needle to withdraw cells from a tumour for microscopy. It is uncertain whether a syringe was added for suction, but substantiated Needle aspiration biopsy was introduced for the parasitological study of lymph nodes early this century.

Menetrice in 1886 first used an aspiration needle to obtain tissue from a carcinoma of the lung and described the microscopic appearance of the specimen.

Mard in 1912 and Guthrie in 1921 used fine needle aspiration cytology to examine enlarged lymph nodes in cases of reticulosis. Subsequent exponents of this technique were martin and Ellis at Memorial Hospital in New York, who in 1926 began examination of a series of palpable malignant lesions, published the first series involving aspiration of a wide variety of Neoplasms consisting of 65 malignancies including 6 breast cancers. Three years later in 1933, Stewart reported the expanded experience in the same institution, which then included 2500 malignancies, with 500 breast cancers. Steward described in detail the pathological interpretation of the material obtained by aspiration. Material was placed on a slide and smeared out and he suggested that the pathologist might obtain experience by smearing fragments from tumours obtained at operation or autopsy.

Ferguson (1930) described the technique in prostate tumour ; Coley, sharp and Ellis (1931) in bone tumours, Forster (1931) in CNS tumours ; sharp in primary carcinoma of lung and Klinger and Burch (1932) as aspiration technique for endometrial tumours. Graver and Binkley (1939) revived the literature in aspiration biopsy and gave the results of a large series of lung biopsies.

Despite the diagnostic success in these large series, there appear to be very little interest in these procedure during the ensuring 25 years. Attention was paid on trucut and drill biopsies. In 1938, Silverman described a device to trap, within the needle, a core which was suitable for histological section. This was variously modified and other devices developed for cutting off the end of the core retaining it. Attempts were then made to improve the cutting edge and teeth and bevels various angles were added to the needle. Thus there developed method of drilling aimed at boring out a core of tissue rather than aspirating a few loose cells. Initially these needles were rotated by hand. But in 1934 and again in 1935 Kirschner described a hollow drill which was rotated by an electric motor through a flexible device.

The technique of FNAC was revived in 1950's by Scandinavians and its application in the diagnosis of palpable breast masses has become increasingly popular in recent years. The original authors used an 18 gauge needle with air dried smear, and required local anesthesia. The Scandinavians introduced the concept of fine needle aspiration with a 23 gauge needle improved cytology fixation and staining technique, and no need for local anesthesia. This procedure was popularized in Scandinavia in 1968 for the diagnosis of breast masses. It has only been in recent years the technique gained

acceptance in the United States. These has resulted from a combination of factors including the ease, rapidity, accuracy and lack of morbidity of the technique, the increase in desire of female patient to have the opportunity to adjust to a define malignant diagnosis before consenting to surgery and relatively low cost of the procedure compared to the open biopsy.

The fine needle biopsy was defined by Godwin[17]. Annals of Newyork academy of Sciences, 63, 1348) as the withdrawal of cells or small bits of tissue through a needle by means of a negative pressure.

Exfoliative cytology defers in aim from aspiration cytology in that the former used primarily to detect a cancer clinically not yet apparent, while the latter is used to determine the microscopic nature of a clinically detectable tumour. In this respect aspiration cytology is similar to histological examination of a surgical biopsy. The term ABC – Aspiration Biopsy Cytology was used by Zajicek and Lawhagel as a synonym of FNAB or FNAC. It (ABC) was chosen to clearly distinguish aspiration from exfoliative cytology and to emphasize its simplicity[24].

Now at the Radium Hemet in Stockholm, about 12,000 aspiration are performed every year. Other centers using these technique on a large scale are the Herzen institute of Oncology in

Moscow, the curie foundation in Paris and the Memorial Hospital in Newyork.

In India[10] these useful cost effective simple investigation has yet to gain popularity though during the last 25 years or so reports have tricked in on these subject, claiming the cells equivalent to those of western counterpart.

Trott and Raadal in 1979 summarized the relative merits of FNAC compared to excision biopsy histopathology as given in the table.

Table No. 1

S. No.	Diagnosis	FNAC	Histopathology
1	Anaesthesia	No	Yes
2	Length of procedure	<5 min	75 min
3	Report available	Few hrs	1 – 2 days
4	False positive	Rare	None
5	False negative	Some	Few
6	Cost	Low	High
7	Specimen abstained	As out patient / bedside	In operating theatre
8	Trauma	Little if any	Yes
9	Stay in hospital	No	Yes

RECENT ADVANCES[28]

With advent of imaging with radiography, ultrasonography and CT scanning, its usage has become still more wider in clinical practice.

GUIDED FNAC

USG GUIDED

Aids in accurate localization of breast lumps. They also to differentiate between solids and cyst lumps Lumps upto 2 mm can be biopsied with the help of USG. 7 MHZ probe is used for better discrimination. Cyst can be aspirated fully and followed up to direct any recurrence.

MAMMOGRAM GUIDED

Mammography taken in two direction can be used to localize non-palpable breast lumps and subject them to FNAC.

STERIOTACTIC GUIDED

This is mainly useful in core needle biopsies and erosion biopsies.

AIMS AND OBJECTIVES

- Out patient assessment of breast lumps
- To compare the results of FNAC and trucut needle biopsy in breast lumps with histopathological examination.
- To assess the incidence of average age.
- To compare the incidence – married Vs unmarried.
- To know the average size of breast lump.
- To evaluate the peak incidence of site of breast lump.
- To compare the incidence – premenopausal Vs postmenopausal.
- To know the average duration of the breast lump.

PATHOLOGY OF BREAST

BENIGN BREAST LUMPS[35]

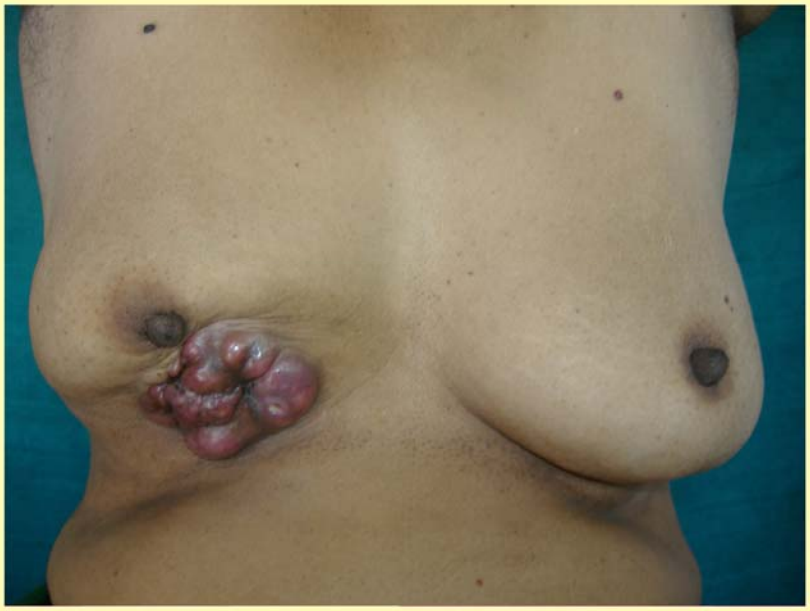
1. Fibroadenosis (Fibrocystic Disease)

It occurs from adolescence through senescence, but particularly during menarche. It generally produces a lumpy feeling rather than a mass per se. It is due to an Aberrations of Normal Development and Involution (ANDI). Areas sectioned with a knife may be white or yellow but never present the grey tones of carcinoma.

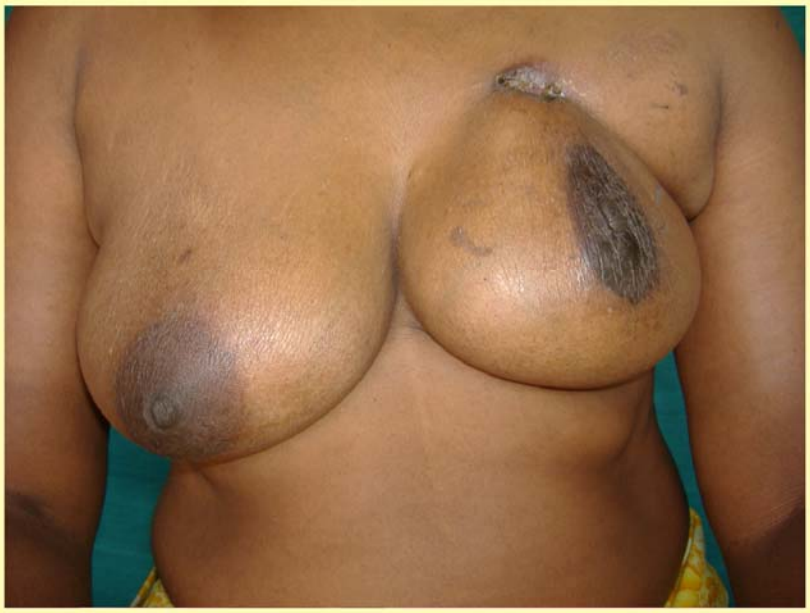
MICROSCOPICAL FEATURES

a. Microcyst Formation – are long standing and vary much in size. They contain dark – mucoid material.
b. Adenosis – an overall increase in Acinal material
c. Fibrosis – swelling of interstitial tissues and round cell infiltration
d. Epitheliosis – hyperplasia of epithetium in the lining of acini
e. Papillomatosis – small branching papillomas inside the cysts or small ducts.
f. Calcification – coarse irregular pattern chemically composed of calcium phosphate or calcium oxalate

CARCINOMA OF RIGHT BREAST



CARCINOMA OF LEFT BREAST
WITH NIPPLE RETRACTION



Fibroadenosis with Epithelial hyperplasia may lead to a malignant lesion. In a large breast the differential diagnosis between fibroadenosis and carcinoma in the very early sage is difficult, when an ill-defined lump is deeply situated.

2. MASTITIS[3]

Acute mastitis due to bacterial infection most commonly occurs within the first few weeks of lactation. Infection usually results from staphylococci or streptococci entering the breast through abraded or lacerated nipple surfaces or by way of lactiferous ducts as they enter the nipple. Lymphatic involvement results in either cellulitis or frank abscess formation.

Streptococcal infection tend to produce a diffuse cellulitis often with systemic toxic manifestations. Abscess formation is more common in staphylococcal aureus infections. Usual cause of chronic mastitis with abscess formation is tuberculosis, which is secondary to pulmonary or chest wall diseases. Chronic mastitis when associated with a thick fibrous wall cannot be differentiated clinically from a carcinoma.

3. FAT NECROSIS

It occurs following trauma either direct or indirect (e.g.) contraction of pectoralis major. In recent cases a superficial brushing

suggests the cause. The disease can situated carcinoma because of skin retraction. On cut sections, a chalky white area of necrotic fat is found resembling necrosis seen in subsiding acute pancreatitis.

4. DUCT PAPILLOMA

The papilloma projects in to a dilated duct, usually in the vicinity of the nipple. Initially resembling a small raspberry but later gets a smoother outline. Finally, distending the ducts it becomes a solid, compact mass. It is the cause of a bright red, a dark blood stained or rarely a serosanguinous discharge per nipple. A cystic mass may be palpable behind the nipple.

5. FIBROADENOMA[14]

It is a slow growing benign Neoplasm with a predilection for the young adult, majority of cases before the age of 63 years. It may be caused by Hormonal Imbalance, when the concentration of oestrogen is high they tend to grow faster (i.e.) during Adolescence and pregnancy. Palpation reveals a dominant, discrete, mobile rubbery mass, usually no greater than 3 cm in diameter. The cut surface is solid, grayish white, and belonging, with a whorl like pattern and slit like spaces. Necrosis, it may be hyalinised or calcified (Ref. Line. T.S.1981).

Although mixed forms occurs, the encapsulated, predominantly stromal tumour is of two varieties on histologic section. The intracanalicular, fibroadenoma with broad, polypoid, loose branches of connective tissue lined by cuboidal ductal cells, emerges from and obliterates the duct. The pericanalicular, fibroadenoma encircles the ducts with dense, concentric mesenchyma.

6. CYSTOSARCOMA PHYLLOIDES

This is a rare variant of fibroadenoma often referred to as a giant fibroadenoma. When it was first described by Muller (1838), it received its name because the tumour contained large cysts and was fleshy, a connotation for the term “Sarcoma” at that time. Large surface clefts were thought to resemble leaves in a book, this accounts for the choice of the term “PHYLOON” most of these tumours are benign (Leaf). But a few develop true sarcomatous potential.

7. GYNAECOMASTIA

It is the enlargement, probably endocrine related, of the male breast and it most common in adolescent and elderly persons. Although there is often generalized hypertrophy, there may be a discrete tumour adjacent to the nipple. Microscopic examination reveals ductal hyperplasia and dilatation, loose stromal proliferation and an inflammatory infiltrate.

8. GRANULAR CELL MYOBLASTOMA

The origin of this tumour is obscure, perhaps in smooth muscle or histocytic or neurogenic tissue. Clinically, both macroscopically and microscopically, the tumour may appear poorly demarcated and the overlying skin may show atrophy and retraction. The non-capsulated tumour nests may be diffused dispersed in sheets or small groups. However, the cells, with fine acidophilic granule are morphologically benign.

9. MESENCHYMAL BENIGN NEOPLASMS

Rarely lipoma, Epidermal inclusion and Sebaceous cyst, Fibroma, Keloid etc are like the same as in any other parts of body. Their general pathological account are beyond the scope of this study.

MALIGNANT NEOPLASMS[35]

CLASSIFICATION

Foot and Stewart have stressed the fact that cancer of the breast can arise from either, the lobules, the ducts or the nipple, with the tumour arising from ductal epithelium in the majority of cases.

I. Carcinoma of nipple – Paget's disease

II. Carcinoma of the ducts

A. Non infiltrating

1. Papillary

2. Comedo

B. Infiltrating

1. Papillary

2. Comedo

3. Adeno carcinoma with fibrosis (scirrhous carcinoma)

4. Medullary carcinoma with lymphoid infiltration

III. carcinoma of lobules

A. Non-infiltrating

B. Infiltrating

IV. Others

1. Mucinous carcinoma

2. Sweet gland carcinoma

3. Inflammatory carcinoma

NON INFILTRATING PAPILLARY CARCINOMA

It is a type of ductal carcinoma insitu and it is a rare variety, arise from large, medium or small ducts. The papillary formation is evident but a typical and distribution from benign – papillomatosis of cystic hyperplastia may be difficult. The most valuable feature is loss of normal cell polarity and arrangement.

NON INFILTRATING COMEDO CARCINOMA

It arises in the smaller or intermediate sized ducts. The worm like casts of comedo can be expressed from cut surface. The cells are more anaplastic than papillary carcinoma. They completely occupy and distend the ducts.

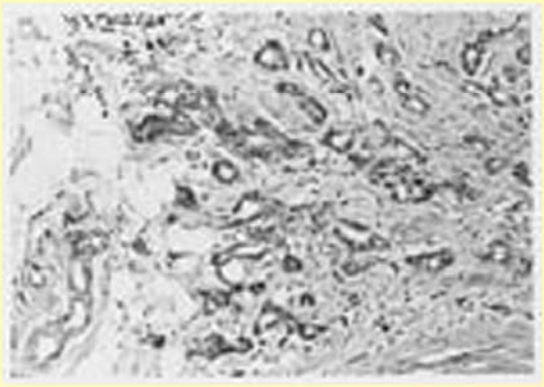
INFILTRATING ADENO CARCINOMA WITH FIBROSIS

This is the most common type of breast carcinoma accounting for about 70-75% of the total cases, commonly known as scirrhous adenocarcinoma. The tumour cells possess infiltrative properties and have the ability to Evoke fibrous tissue profileration. Hence the tumour becomes adherent to the surrounding tissues and the skin.

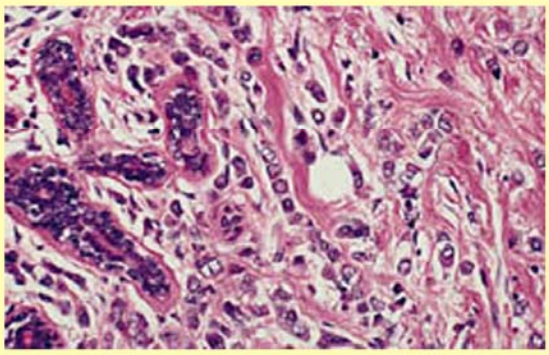
It presents an unyielding induration to the knife and gives a sensation of cutting through an unripe pear. The cut surface is depressed owing to the pull of fibrous tissue.

There is a great variation microscopically. Most frequently the cells are spheroidal and arranged in small clumps and columns or in a single file. In other cases the picture is more cellular with cells being hyperchromatic and pleomorphic. Sometimes an almost acellular field with the few cells compressed and narrowed by dense collagenous stroma is seen.

INVASIVE DUCTAL CARCINOMA



INVASIVE LOBULAR CARCINOMA



MEDULLARY CARCINOMAS WITH LYMPHOID INFILTRATION

It is bulky, soft and rounded. Haemorrhage and cyst formation are common. The cells lack the invasive biological activity of the scirrhous type, so the tumour is not adherent to the skin.

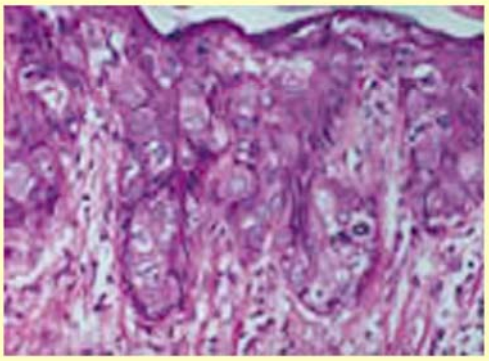
Microscopically the cells which are arranged in large masses have abundant cytoplasm with large vesicular nuclei and many mitoses. Infiltration with lymphocytes is a highly characteristic feature.

LOBULAR CARCINOMA[36]

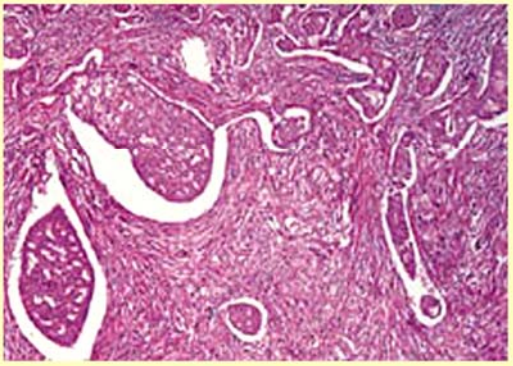
In this type the cells appear to arise with in the lobule itself. It may be non infiltrating or infiltrating.

The non infiltrating type is carcinoma insitu. It cannot be recognized in the gross and is an incidental finding. Microscopically, it consists of large lobules confined to a limited area. The acinar cells are piled up and are arranged in an irregular fashion. The appearance of solid masses in enlarged lobules is characteristic. The infiltrating type is indistinguishable in the gross firm scirrhous carcinoma. Microscopically, it can be distinguished from that variety only by finding examples of pre-invasive pattern in the neighbourhood. Both forms of lobular carcinoma are uncommon.

PAGET'S DISEASE



SARCOMATOID CARCINOMA



PAGET'S DISEASE

It is found in women 40-60 years of age and commences as an eruption of the nipple and areola. Following a variable period of 2-10 years a mass becomes palpable beneath the areola. The eczematous area is bright red and inflamed with a moist and weeping or a dry, scaly surface.

The microscopic picture presents, three features :

1. Epidermal hypertrophy
2. Paget's cells
3. Sub-epidermal round cell

Epidermal hypertrophy is a constant feature before ulceration occurs, papillae being increased in depth and width.

Pagets cells are large clear vacuolated cells with small pyknotic nuclei. They look like clear spaces punched out of the epidermis. The superficial part of the dermis shows round cell and plasma cell infiltration. Proliferation changes in the epithelium of the breast are also seen.

MUCINOUS CARCINOMA

This tumour has gelatinous materials within it and has sharply delineated margins. Mucinous carcinomas are usually large, bulky tumour, reddish brown or purplish in colour with slimy material

present on the cut surface. The cells have acquired the ability to form mucin. Microscopically mucin filled cells surrounded cyst like spaces. Some of the tumours show clumps of tumour cells in a sea of mucoid material. The cells are often well differentiated and may even have a signet ring appearance.

SWEAT GLAND CARCINOMA

The mammary and sweat glands have a common origin. Structures which are apparently sweat gland tubules occur in the normal breast and anastomose with the lacteal ducts. They are distinguished by eosinophilia of the cytoplasm and an inner layer of high columnar cells. Certain carcinoma of the breast especially situated at the periphery may show these characteristics and hare called sweat gland carcinoma. Their behaviour is the same as that of ordinary breast carcinoma.

ACUTE INFLAMMATORY CARCINOMA

The term inflammatory carcinoma reflects the appearance of the breast : hyperaemia, tenderness, skin retraction and oedema producing the characteristic peau d' orange. Although usually diffuse, the malignancy may resemble a localised abcess. Histologic section reveals widespread carcinoma, often the inflammatory ductal variety

with nests of tumour in the dermal and epidermal lymphatics. Blockage of vessels may cause the cardinal signs of inflammation.

MIXED DUCTAL AND LOBULAR CARCINOMA

This is a very rare carcinoma, it composed in part of a component with definite features of invasive ductal carcinoma and in part of a component with definite features of invasive lobular carcinoma do occur.

This tumour has to be distinguished from tubular carcinoma and from the cases in which two separate neoplasms of different microscopic appearances are present in the same breast.

METAPLASTIC CARCINOMA

Metaplastic carcinomas in a genetic term for breast carcinoma of ductal type in which the predominant component of the neoplasm has an appearance other than epithelial and glandular and more in keeping with another cell type.

1. SARCOMATOID CARCINOMA

(Carcinoma with sarcoma like stroma)

Grossly, it is well circumscribed. Microscopically, the sarcomas like component may resemble malignant fibrous histiocytoma, chondrosarcoma, osteosarcoma, rhabdomycosarcoma, angiosarcoma (or) combination of them.

2. SPINDLE CELL CARCINOMA

The overt carcinomatous component of these tumours, entirely squamous. The spindle cell component, which may be deceptively bland, forms abundant fibrocollagenous stroma with featured, myxoid, angioid and storiform patterns. The appearance may closely simulate that of a fibro sarcoma or even fibromatosis.

3. Carcinoma with osteoclast like giant cells

4. Squamous cell Carcinoma

5. Others

CYTOLOGICAL APPEARANCES IN MAMMARY DISEASE

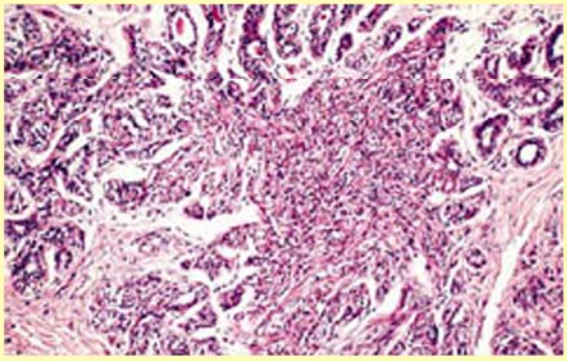
I. MALIGNANT NEOPLASMS[35]

a) CARCINOMA

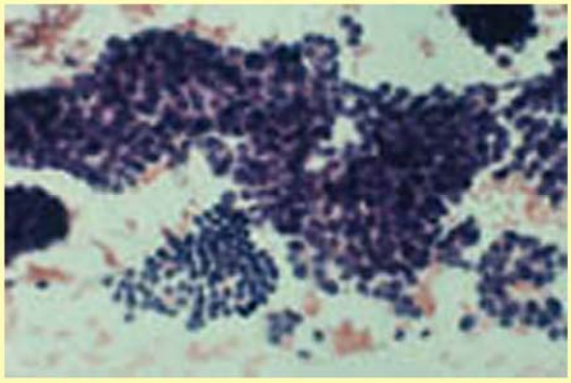
Criteria for diagnosis

1. The most important criterion is the cellularity. Aspiration from carcinomas are usually very cellular.
2. Due to loss of cohesiveness, cancers cells are frequently present in small groups and also as single cells.
3. Overlapping of cells and crowding in seen
4. Nuclei are pleomorphic. Enlarged in size and of irregular shape. Nucleoli are present.
5. High nucleocytoplasmic (N/C) ratio
6. Intranuclear variants are seen in some benign and malignant breast tumours, hence not of much use in diagnosis.
7. Mitoses may or may not be seen and so it not a useful criterion
8. Groups of carcinoma cells in fat indicates infiltration

SCELEROSING ADENOSIS



FNAC - DUCTAL CARCINOMA



Cytological characteristics of benign and malignant aspirates are compared

FNAC OF BREAST – SMEAR CHARACTERISTICS

Table No. 2

Cytological Findings	**Benign**	**Malignant**
Pattern	Epithelial cells in sheet and clusters, monolayered, regularly arranged, few single cells	Epithelial cells in clusters of varying size, multi layered, irregularly arranged. Many single cells
Single Cells	Monomorphic oval, naked	Polymorphous round with cytoplasm
Nuclei	Small, uniform	Enlarged, pleomorphic
Chromatin	Evenly distributed, light	Coarse, heavy
Nucleoli	Usually absent	Present in moderate number of cells

Two most important criteria are cellularity and nuclear atypia. To avoid over diagnosis which can lead to a mutilating surgery, conservative approach while giving positive report of carcinoma in essential. No diagnosis of malignancy should be given if only one of the above mentioned criteria in identified.

It is also important to remember that the impression of carcinoma should be recognized in several fields of the smears. When the smears are extremely cellular, but lack sufficient atypicality for a firm diagnosis of carcinoma. It is advisable to ask for a biopsy. In most of these cases, the lesion will be a well differentiated duct carcinoma. Repeat aspiration will be of no further help in such a situation.

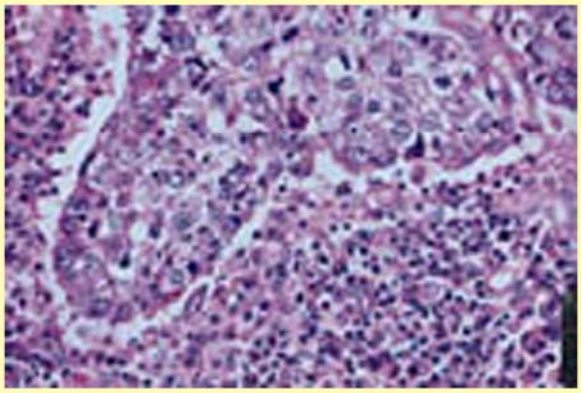
TYPING OF BREAST CARCINOMA

Typing of the carcinoma may help the clinician in prognosticating the diseases and deciding the line of treatment. Ortel and Galbum have come out with some criteria helpful in classifying different types of breast carcinoma.

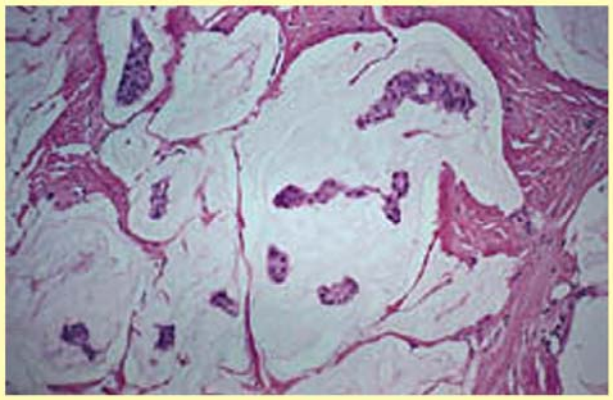
i) Medullary Carcinoma

It is soft of an aspiration. The smears are cellular with bubbly back ground due to proteinaceous material and show varying proportion of lymphoid cells and carcinoma ells. Nuclei of varying

MEDULLARY CARCINOMA



MUCINOUS CARCINOMA



sizes and shapes with prominent nucleoli are seen. These may be naked or with scanty cytoplasms. Few bizzare forms may also be seen. Mitoses are often present.

ii) Mucinous Carcinoma

Like medullary carcinoma, this type of carcinoma in also soft to aspirate. Aspirated sample consists of abundant bluish pink mucoid material. Smears are thick and show tight groups of cells. Often nuclei are regular. Metachromasia may be seen in Giemsa sainted smears. A striking feature observed is the presence of many branching blood vessels running through the mucus pools.

iii) Tubular Carcinoma

Cellular aspirates reveal groups of ductal cells with blunt branching and tubular lamina. On low power these groups mimic fibroadenoma, but naked nuclei are not present. Groups of epithelial cells with branching are not as complex as seen in fibroadenoma.

iv) Adenoid cystic carcinoma

Large number of cells are seen in abundant pale pink mucoid background in which bright pink dense globules are seen. Most of these globules are surrounded by cells with small, round regular nuclei.

v) Papillary carcinoma

Aspirate is usually haemorrhagic and thick. The smears are cellular fragments of tissue with fibrovascular core and finger like projections are present. Nuclei are usually enlarged but regular.

vi) Lobular carcinoma

This type of carcinoma, like infiltrating duct types, is fibrous and gritty on aspiration. Aspirates are not usually cellular. Smears reveal small cells in a small groups in short chains (Indian files) or as scattered single cells. Not much variation in nuclear characters and size is seen.

vii) Malignant cystosarcoma phylloides

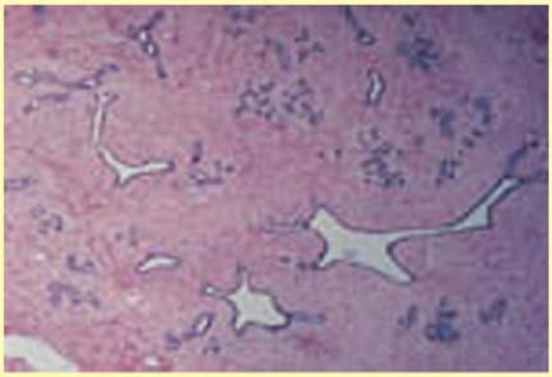
smears are similar to those from fibroadenoma. Stromal fragments show cellularity and nuclear atypia. Pleomorphism, hyperchromasia and frequent mitoses suggest a malignant neoplasm.

II. BENIGN LESIONS

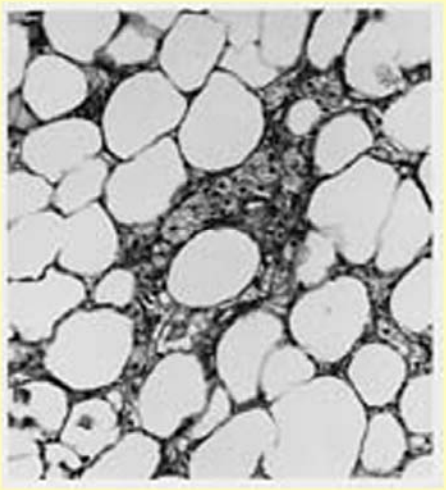
a. Fibrocystic diseases

Aspirates are not cellular. The material consists of metaplastic apocrine cells, benign ductal epithelial cells in fluid back ground and fragments of fibroadipose tissue. In addition, few foamy macrophages and inflammatory cells are seen. Aspirates from these lesions are

FIBROADENOMA



FAT NECROSIS



often unsatisfactory. Presence of apocrine cells are necessary for the diagnosis of fibrocystic disease.

b. Fibroadenoma

Fibroadenoma can be readily diagnosed cytologically as usually these yield cellular aspirates. Smears are rich in large tight sheets of benign ductal epithelial cells admixed with naked nuclei within the clumps and also scattered single epithelial clusters reveal blunt branching. Stroma can be myxoid.

c. Abscess

Aspirated material consists of thick yellowish pus. Smears are thick and show numerous polymorphs, fibrin strands, foamy macrophages, cellular debris and occassional groups ductal epithelial cells. Inflammatory atypia when present create diagnostic problems. However, carcinoma in usually not associated with such marked acute inflammatory component.

d. Fat necrosis

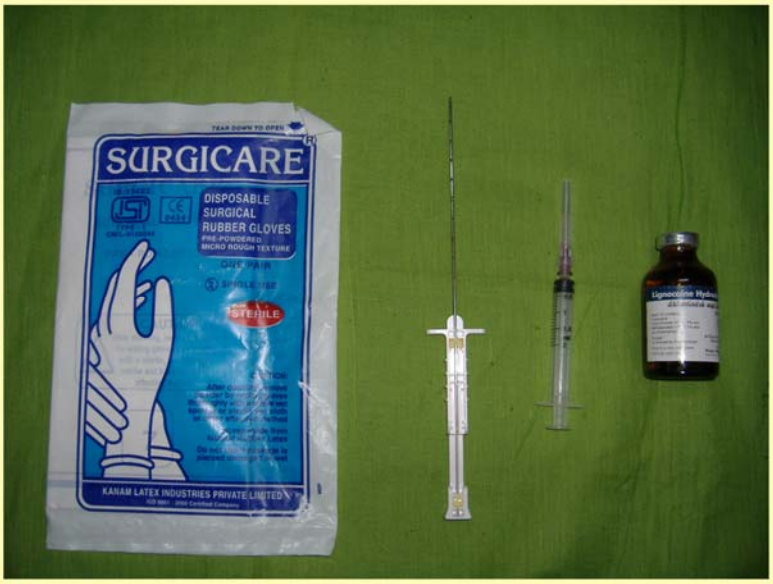
Numerous lipid laden macrophages and epithelial cells are seen in the back ground of acute and chronic inflammatory cells. Fatty vacuoles of varying size are present. Cytology atypia is often present.

MATERIALS AND METHODS

Sixty five patients presenting to surgical out patient department of Coimbatore Medical College during 2005 - 2006 period, were subjected to Fine Needle Aspiration Cytology and Trucut Needle Biopsy. All the patients underwent surgery depending upon the report of the two methods and finally all the reports of the techniques were matched with the histological report of the excised specimen.

FNAC - MATERIALS

TCNB - MATERIALS



A. TECHNIQUES OF FNAC

It need not be emphasized that the proper clinical examination of the patient is to be carried out in detail and the disease process must be localized and clearly defined. Simpler investigation should be done routinely in every patient.

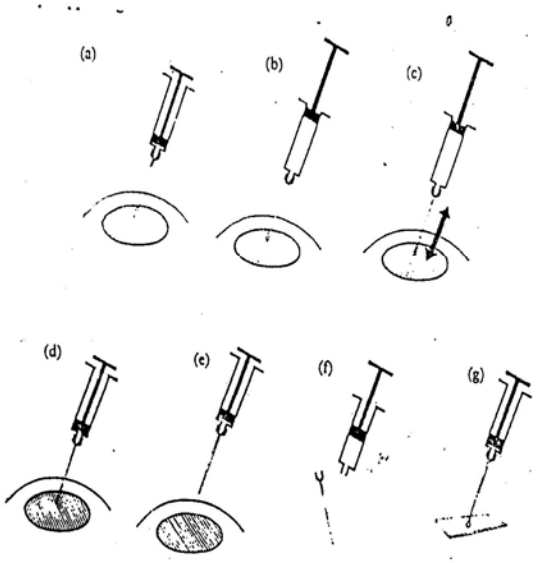
The case should be discussed with the pathologist before the FNAC[23] is being one regarding the feasibility and the likely informative value of FNAC in the particular case concerned.

PREPARATION FOR FNAC

EQUIPMENTS REQUIRED

1. 23 gauge 0.6 – 1 mm, external diameter disposable needles 2.5 and 5 cm long.
2. 10 – 20 mm disposable syringe with leur lock tip
3. "CAMECO" syringe pistol
4. Microscopic glass slide with frosted ends
5. Fixative
6. Alcohol sponges
7. Sterile gauze pads
8. Sterile containers
9. others

STEPS IN TECHNIQUE OF FNAC



a. Sterile needle is inserted quickly through the skin, but slowly towards the target area.
b. The plunger of the syringe is retracted to produce and maintain a negative pressure.
c. The needle is moved in various directions to sample cells from different areas by rapid back and forth, short strokes.
d. The needle is pulled out until the subcutaneous tissue is reached.
e. The syringe is completely released to equalise the pressure
f. The needle is then gently withdrawn and disconnected from the syringe
g. The material present in the core of the needle is expressed on one or several alcohol - moistened slides.
h. Without undue pressure, smeared with the help of another "dry" slide.
i. If there are large tissue particles, the particles are first smeared on one or two sides.
j. Then placed in formalin solution for sectioning.
k. A small amount of saline solution is aspirated to rinse the needle core and syringe.
l. In case of an abundance of cellular material, the specimen should be centrifuged to form a cell block for sectioning.

NEEDLES

Standard disposable 25-22 gauge 25-50 mm long needles are suitable for most superficial, palpable lesions.

Finest needles (25 gauge) are recommended for children and for sensitive areas like orbit and eyelids.

Thicker needles offer no advantages instead cause more bleeding and can be blocked by plug of tissue and carry the risk of tumour implantation in the needle track.

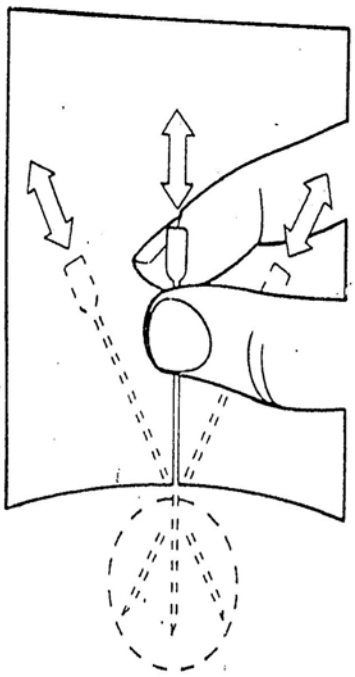
The 22 gauge, 90 mm disposable lumbar puncture needles with trocar are convenient for most deep lesions.

If still longer needles are required, then a 22 gauge 150 – 200 mm chible needle can be used. Franzen instrumentation provides special long needles for biopsy of prostate and pelvic organs.

Rotex II screw needle (0.8 mm, 145-205 mm size) is used for deep biopsy of lung, liver, kidney, lymphnodes etc. This is particularly useful in fibrous lesions, soft tissue tumours and in richly vascular lesions.

However the standard needles are less expensive, easier to use and give a satisfactory yield in majority of cases if the technique is correct.

NEEDLE BIOPSY WITHOUT ASPIRATION



The needle is moved to and fro within the target tissue varying the angle to cover a larger area. Admixture with blood is less than with aspiration.

Standard disposable plastic syringes of 10-20 ml are used. It should be of good quality for strong rigid material and produce a good negative pressure.

SYRINGE HOLDERS

The use of syringe holder is strongly recommended. Leaving one hand free to immobilize and to feel the target lesion allows better precision in placing the needle. Regularly used syringe holder is cameco syringe pistol (Cameco AB, Taby, Sweden) made to fit either 10 mm or 20 ml syringe.

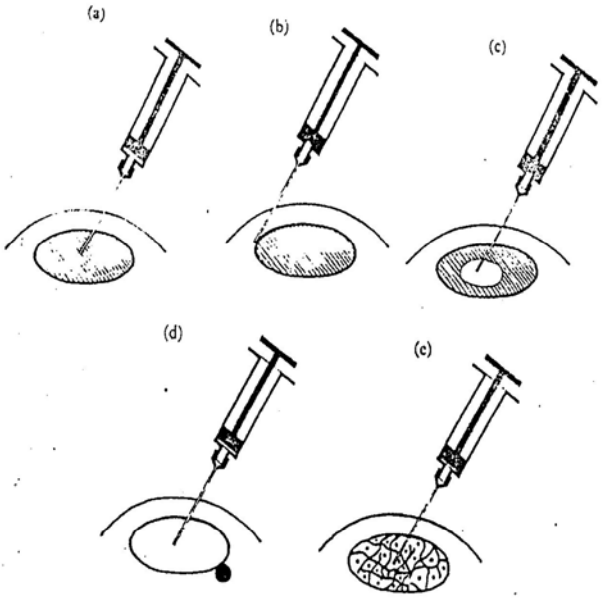
SLIDES

They should be dry and free of grease, those with frosted ends are convenient for immediate labeling. A 0.1 mm haemocytometer cover slip gives better control over pressure used in smearing. Air dried slides are best transported in stainless steel carrier to avoid contamination and scratching.

FIXATIVES

For wet fixation, 70-90% ethanol preferably in koplin jars (for spongy fixatives) is used. Canroy's fixative has the advantage of lysing RBCS. Glutaraldehyde with 10% buffered formalin is used if tissue fragments are needed.

CAUSES OF UNSATISFACTOFY YIELD



a. Needle well positioned within the target tissue should produce satisfactory yield.
b. Needle has missed the lesion tangentially
c. Central cystic, necrotic or haemorrhagic area devoid of diagnostic cells.
d. Small malignant lesion adjacent to dominant benign mass
e. Fibrosclerotic target tissue poor in cells.

STERILE CONTAINERS

Those filled with physiological saline or Hank's balanced salt solution is used to rinse the needles and syringes to obtain material for culture.

OTHERS

Skin disinfectants, sterile dressing, local anaesthetic, watch glass. Thrombin powder, pencil, tongue depressor and sterile blades.

PREPARATION OF PATIENT

Clear explanation of the procedure to the patient will ensure the patients consent and better cooperation.

Informed consent should be obtained.

Selective positioning of the patient is must for particular anatomical areas.

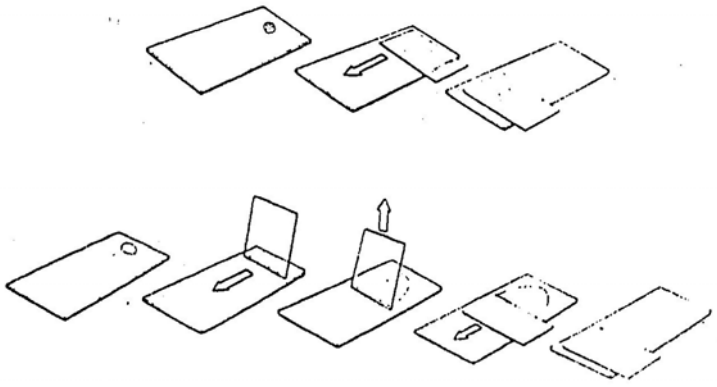
Preparation of local area with sterile swabs are done preliminarily. Local anesthetics are applied only when required. It is not always indicated but if given if facilitates multiple passes more acceptable by the patient.

PROCEDURE

INSERTION OF NEEDLE

Better control over needle is achieved by supporting the barrel of syringe by the forearm. Vertical approaches tend to be less painful

DIRECT SMEARING



Upper : Smear technique suitable for a dry aspirate

Lower : Smear technique suitable for a wet aspirate

and allows better appreciation of depth. If needed, imaging techniques may be used to localize the lesion for favouring correct insertion of needle.

ASPIRATION[1]

This mechanism has been explained well by THOMBSON. The function of the negative pressure used is not to tear cells from the tissue but to merely fix the tissue against the sharp clothing edge of the needle. The softer tissues protruding over the edge are cut off and accumulate in the lumen of the needle as it advances through the tissue (eg) tumour cells, glandular and epithelial elements. But the stroma is poorly represented in the aspirate.

For greater yield, the needle should be moved back to forth especially in fibrous lesion. This is termed as Jackhammer method. Sometimes, multiple passes may be needed for obtaining satisfactory number of cells. But in case of vascular tissues, it produces more blood in the sample. Blood in the syringe means an unsatisfactory aspirate.

The ideal aspirate has high cell content in a small amount of fluid, a creamy consistency and remains within the lumen of needle.

It is necessary to release the negative pressure before the needle is withdrawn. This prevents the aspirate to get into the syringe or being contaminated with contents aspirated during withdrawal.

NEEDLING WITHOUT ASPIRATION[27]

It was introduced by Zajdela in the principle that the capillary pressure of the fine needle is itself sufficient to keep the cells within the lumen. Here the negative pressure and aspiration are not used. Simple insertion and back to forth movement is applied while simultaneously feeling the consistency of tissue concerned thereby improving precision, lesser admixture of blood cells, it cell yield is some what less but not significantly so.

A 25 gauge needle is preferably used this technique. It can be used in all superficial lesions (except cystic and fibrotic ones) and deep lesions (when more blood aspirated by regular technique).

After the procedure is over, application of gentle pressure over the biopsy site is important to minimize bruising and to decrease the chance of haematoma formation in case of highly vascular lesion.

CAUSES FOR UNSATISFACTORY YIELD[32]

1. Needle has missed the lesion tangentially.
2. Central cystic, necrotic or haemorrhagic area devoid of diagnostic cells

3. Small malignant lesion adjacent to dominant benign mass
4. Fibrosclerotic target tissue poor in cells
5. Mislabeling or interchanging of specimen either during collection or in laboratory
6. Deterioration of specimen because of delayed processing or poor fixation
7. Imperfect staining
8. Contamination
9. Lack of an adequate history

PREPARATION OF ASPIRATE

DIRECT SMERING

An aspirate is said to be “Dry” if it consists of numerous cells suspended in a small amount of tissue fluid and has a creamy consistency and this is perfect one. In contrast, a ‘wet’ aspirate is a one which consists of small number of cells suspended in fluid or blood. A dry aspirate is best smeared with the flat of 0.4 mm. Coverslip exerting a light pressure to achieve a thin even spread, the firm pressure causes crush artifacts. So it should not be too thin or too thick.

A wet aspirate should be smeared in a “two step” method. The first step is moving the coverslip or the smearing slide to the middle of

specimen slide, holding it at an obtuse angle which leave the fluid and makes the cells follow the smearing slide like buffy coat. The second step is same as that described under dry aspirate smearing.

The correct technique should be followed especially in air dried smear good fixation depends on rapid drying.

If large amount of blood is aspirated it is expressed onto and spread over a watch glass before clothing and minimal particles are picked up for histological processing.

If the sample is large enough, several slides can be prepared both air dried and wet fixed so that special staining can be carried out if required.

FIXATION AND STAINING

We are using isopropyl alcohol as a fixative. Fixation does not require more than a few minutes of thirty minutes to one hour is advisable for proper adhesion of the smear to slide. Number of fixatives are used in cytology. The common ones are modification of 95% ethyl alcohol can be used on its own with satisfactory results but the addition of 3% glacial acetic acid increase the nucleoprotein fixing properties.

This is the standard fixative and gives excellent nuclear and cytoplasmic morphology.

STAINING PROCEDURES

Smears can be stained by pappanicolaou or by standard hematoxylin and eosin methods. The basic constituent of both stains is Harris hematoxylin.

Cytoplasms of cornified cells – reddish – pink. Cytoplasm of non cornified cells green (deeper the younger cells, lighter in the mature cells).

Nuclei are stained blue.

SPECIAL STAINS

1. PAS / Diastase or Alcian blue for mucin
2. Prussian blue for iron
3. Masson – Fontana for melanin
4. Grimelius for argyrophilic granules
5. Congo red for amyloid
6. Gram / PAS / Gomori silver stain for microorganisms
7. Ziehl – Neelson for AFB
8. Special stains for pneumocystis, Nocardia or Actinomycetes.
9. PAS for glycogen
10. Oil red – O – for fat
11. Fouchett's reagent counter stained with Sirius red for bile pigments.

12. Formaldehyde induced fluorescence for amine, melanin precursors.

Air dried smear are suitable for enzyme histochemistry (eg) Acid phosphatase in carcinoma prostate.

PHASE CONTRAST MICROSCOPY

Phase contrast of unstained smears is an useful tool to check the quality and representatives of smears to be used for immunoperoxidase staining or for EM so that time and reagents are not wasted on unsatisfactory samples.

ULTRASTRUCTURAL STUDIES

Aspirate obtained by FNAC are also suitable for

- Immuno cytochemistry
- Enzyme cytochemistry
- Electron microscopy
- Flow cytometric quantitation of DNA

COMPLICATIONS AND HAZARDS OF FNAC

FNAC is associated with relatively few complications. Possible commonly encountered complications are as follows :

1. HAEMATOMAS

Bleeding from the puncture site and haematoma formation are the commonest complications of the procedure. Firm pressure for 2-3 minutes immediately after the procedure greatly reduces this problem.

2. INFECTION

Introduction of infection is not a significant hazard in breast FNAC. Transrectal aspiration in cases of acute prostatitis may result in bacteraemia.

3. DISSEMINATION OF TUMOUR

Generally dissemination of malignant cells following FNAC is a theoretical possibility. Local dissemination by seeding of malignant cells along the needle tract is a rare complication.

B. TECHNIQUE OF TRUCUT NEEDLE BIOPSY (TCNB)

REQUIREMENT FOR TCNB[9]

a. Needles

Disposable trucut needle 16 G or 18 G which can be used for about 5 to 6 cases (or) metal trucut needles which can be used for about 15 to 20 cases can be used. In this study 18 gauge disposable trucut needle used.

b. Syringe

2ce disposable syringe for local anaesthesia

c. A local anaesthetic (2% xylocaine) cotton and spirits

TECHNIQUE OF TCNB[22]

The palpable lesion is fixed with two heads of assistant. The skin in cleaned and local anaesthetic is infiltrated. The needle is inserted and as soon as the lump in reached, the needle is advanced. Once the inner needle is inside the mass the outer needle is pushed and whole trucut withdrawn. The material inside the stillet is taken and sent for HPE.

CAUSES OF FAILURE

(REF. GIBSON & SMITH 31, 1957)

1. TECHNICAL

a. Faulty aspiration – failure to insert the needle in to the tumour especially when the tumour in small and breast in large and fatty
b. Blocking the needle with fat
c. Local anaesthetic, if used, may dilute the specimen
d. Faulty fixation and staining

2. INTERPRETATION

For proper interpretation, adequate smear and expert cytopathologist are essential.

Both the procedures was clearly explained to the patient and informed written consent was obtained. The procedure was carried out in the treatment room of the ward and in the supine portion with the breast well exposed.

In this study, for FNAC we used 24 gauge needle and for trucut, 18 gauge needle.

The FNAC sample was usually reported within 24 hrs by our pathologist, whereas for TCNB, it will take of about 72 hrs.

All the reports were read by a single pathologist and HPE report was also read by the same pathologist without revealing the FNAC and TCNB reports.

CYTOLOGICAL REPORT

According to UK National Health Science screening[35] programme. Cytological report divided into following categories.

1. Normal tissue / inadequate sample
2. Benign lesions – e.g.) Fibroadenoma / Fibrocystic disease
3. Lesion of uncertain malignant potential (e.g.) sclerosing ductal lesions. Atypical ductal hyperplasia
4. Suspicious of malignancy
5. Malignant

OBSERVATION AND ANALYSIS

Total number of patients in this study was 65. Out of a total 65 breast lump aspirations in 65 patients, final diagnosis was benign in 33 breast lumps and malignant in 32 breast lumps.

Analysis of results was done in benign and malignant disease separately.

A. HISTORY

1. AGE, SEX AND MARITAL STATUS

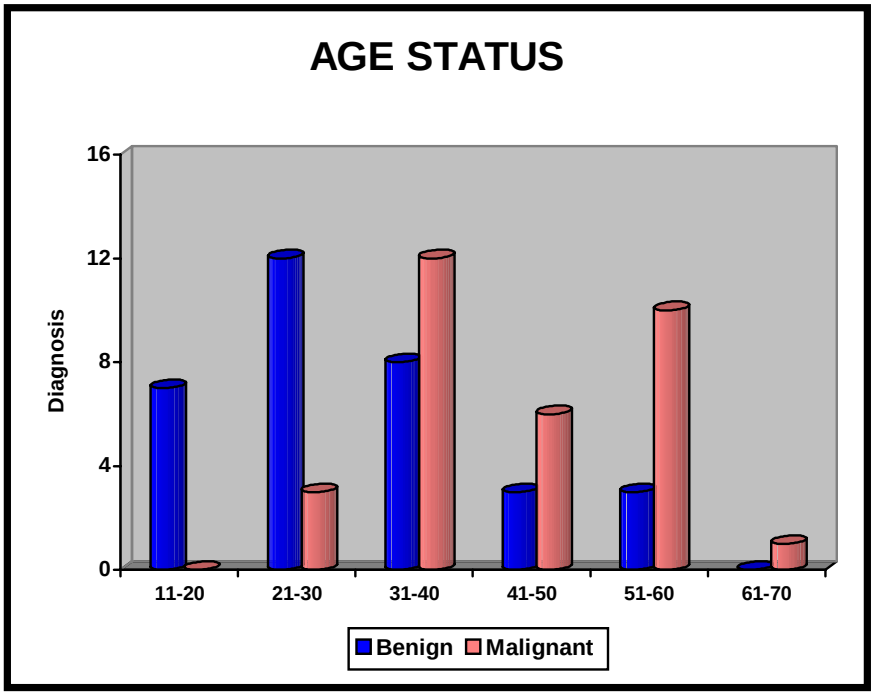
Out of 33 cases with benign breast 23 (56%) were married. Maximum incidence in this group was in 3rd decade (36%).

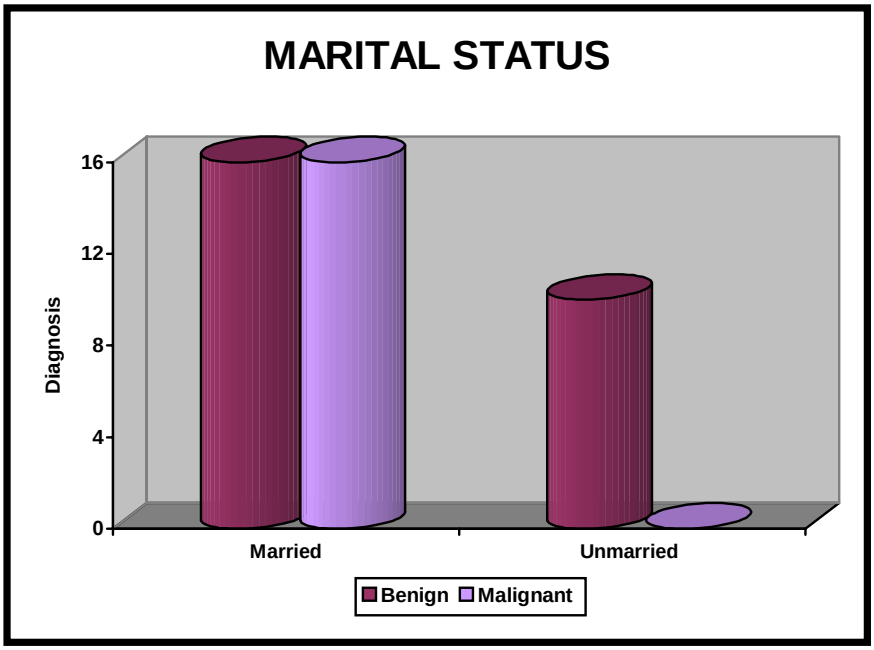
Where as, in 32 malignant breast lumps all were married (100%) peak age incidence was in 4th decade (37%)

Table No. 3

AGE, SEX AND MARITAL STATUS

Diagnosis	No. of Cases	Marital Status		Age in years	No. of Cases
		Married	Unmarried		
Benign	33	23	10	11-20	7
				21-30	12
				31-40	8
				41-50	3
				51-60	3
				61-70	0
Malignant	32	32	0	11-20	0
				21-30	3
				31-40	12
				41-50	6
				51-60	10
				61-70	1


AGE STATUS
16
12
8
4
0
Diagnosis
11-20
21-30
31-40
41-50
51-60
61-70
Benign
Malignant


MARITAL STATUS
16
12
8
4
0
Diagnosis
Married
Unmarried
Benign
Malignant

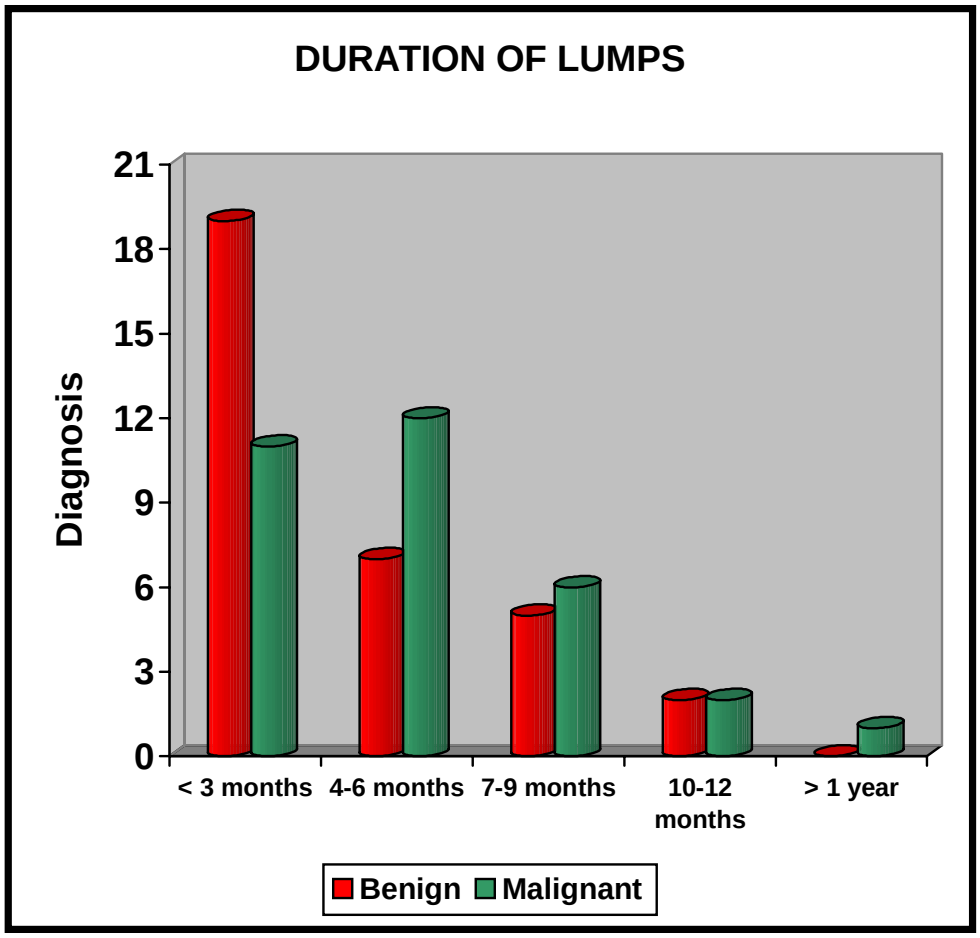
2. DURATION OF LUMP

Among the benign breast lesions, peak group was less than 3 months (19 cases out of 33) peak incidence of malignant lesions falls in the group for 4-6 months.

Table No. 4

DURATION OF LUMPS

Diagnosis	**≤ 3 months**	**4 – 6 months**	**7 – 9 months**	**10 – 12 months**	**> 1 yr**	**Total**
Benign	19	7	5	2	0	33
Malignant	11	12	6	2	1	32

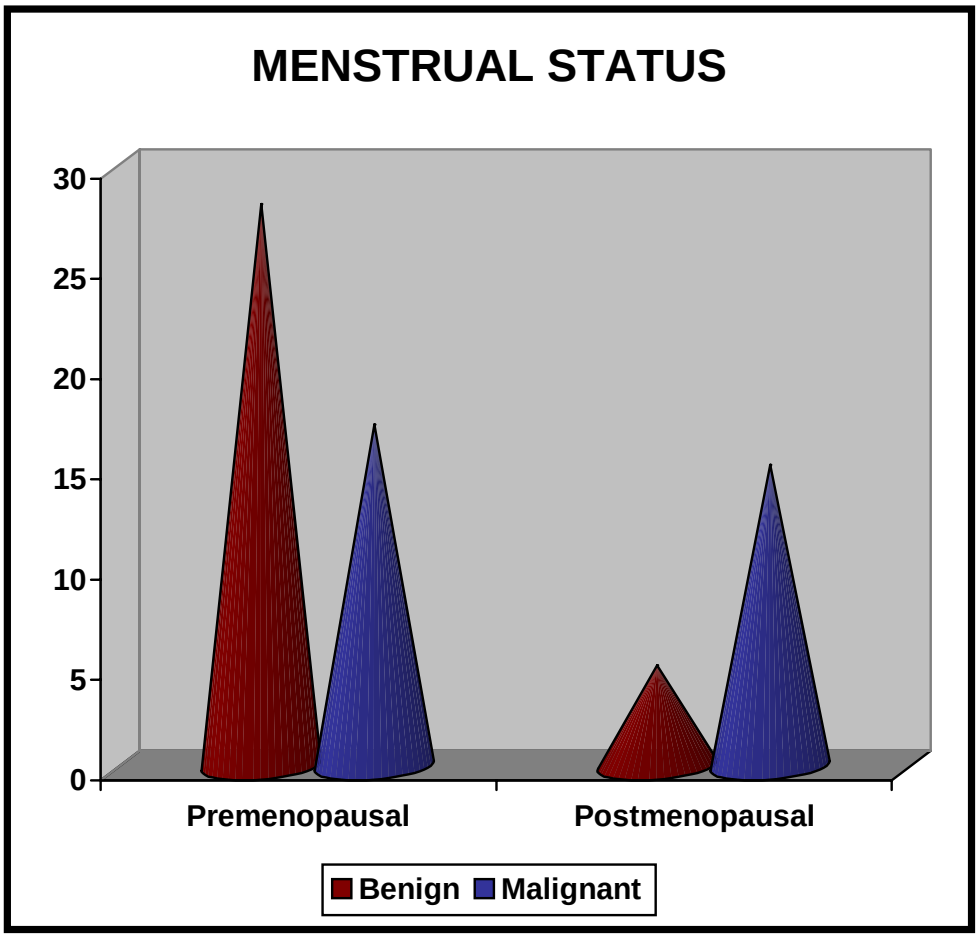

DURATION OF LUMPS
Diagnosis
21
18
15
12
9
6
3
0
< 3 months
4-6 months
7-9 months
10-12 months
> 1 year
Benign
Malignant

3. MENSTRUAL STATUS

Table No. 5

MENSTRUAL STATUS

Diagnosis	No. of Cases	Status of Menstruation	
		Premenopausal	Postmenopausal
Benign	33	28	5
Malignant	32	17	15


MENSTRUAL STATUS
30
25
20
15
10
5
0
Premenopausal
Postmenopausal
Benign
Malignant

B. EXAMINATION

1. NIPPLE CHANGES OF MALIGNANCY

Out of 32 malignant lesions of breast 6 cases showed changes in the nipple suggestive of malignancy in the form of retraction. In the series of benign lesions of 33 cases, no cases showed changes in the nipple.

2. POSITION OF THE SWELLING IN BREAST

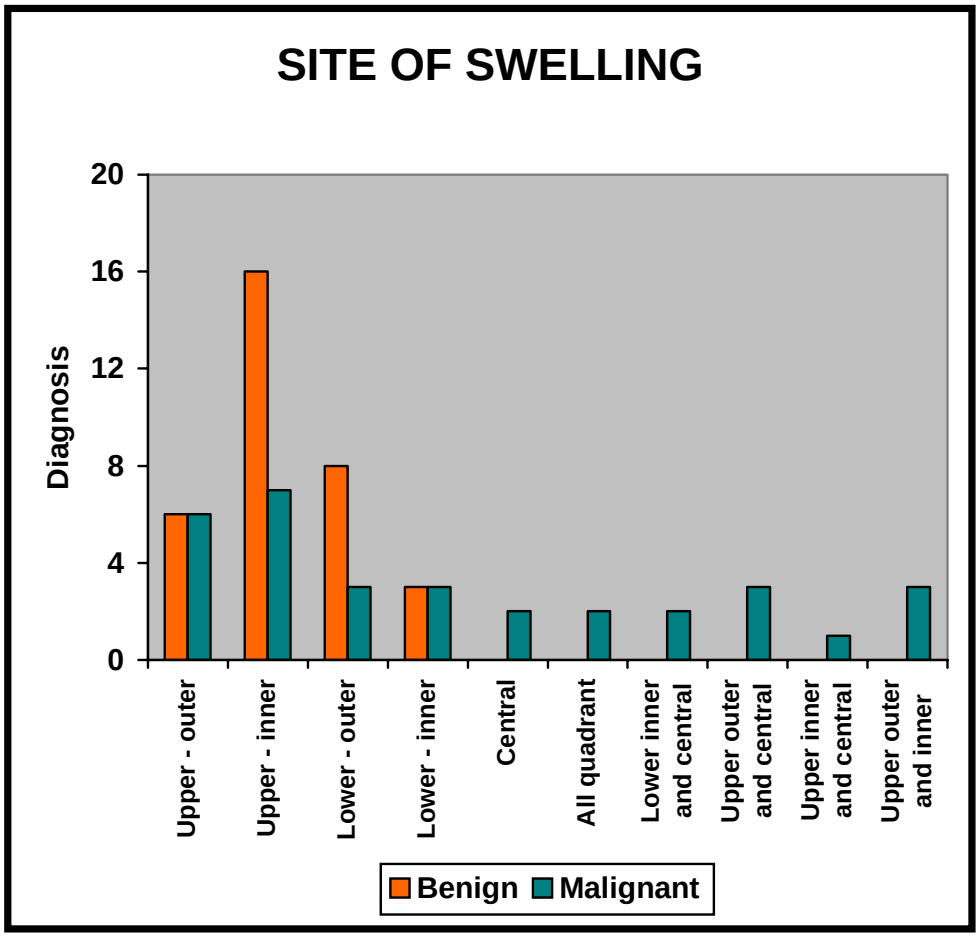
The following table was based on the occupancy of the lump either exclusively or predominantly in relation to quadrants of breast.

Table No. 6

SITE OF SWELLING

Maximum incidence of benign breast lesions and malignant lesions were in upper inner quadrant.

Site	Benign	Malignant
Upper - Outer	6	6
Upper – Inner	16	7
Lower - Outer	8	3
Lower – Inner	3	3
Central	0	2
All Quadrants	0	2
Lower Inner & Central	0	2
Upper Outer & Central	0	3
Upper Inner & Central	0	1
Upper Outer & Inner	0	3
	33	32


SITE OF SWELLING
Diagnosis
20
16
12
8
4
0
Upper - outer
Upper - inner
Lower - outer
Lower - inner
Central
All quadrant
Lower inner and central
Upper outer and central
Upper inner and central
Upper outer and inner
Benign
Malignant

3. SIZE OF SWELLING

Table No. 7

SIZE OF SWELLING

Maximum incidence of benign and malignant breast lumps were 3-5 cm in size.

Size	Benign	Malignant
$\leq$ 2 cm	8	1
3 – 5 cm	23	20
6 – 10 cm	2	11
> 10 cm	0	0
	33	32

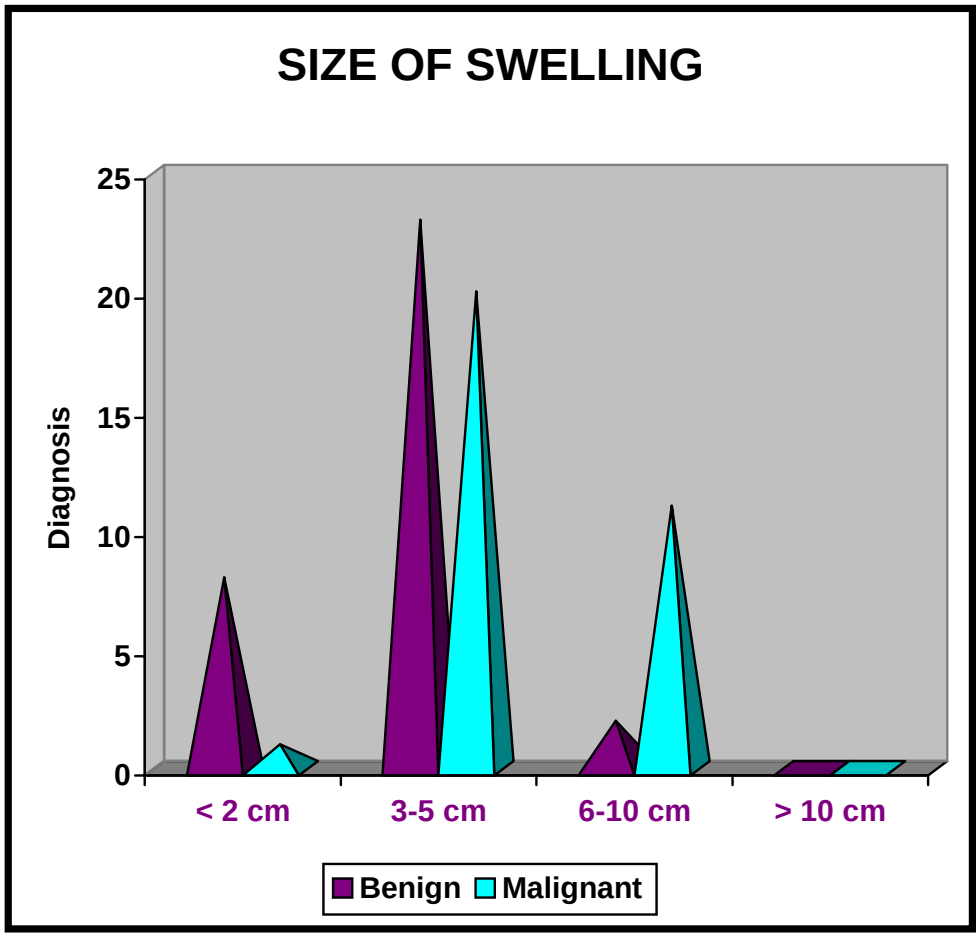

SIZE OF SWELLING
Diagnosis
25
20
15
10
5
0
< 2 cm
3-5 cm
6-10 cm
> 10 cm
Benign
Malignant

Table No. 8

SHOWING CORRELATION BEWTEEN FNAC AND EXCISIONAL BIOPSY HISTOLOGY

Sl. No.	Excisional Biopsy Histology	Correct Diagnosis	False Positive	False Negative	Insufficient
1	Fibroadenoma (28)	27 (96%)	-	-	1 (4%)
2	Ductal carcinoma (25)	22 (88%)	-	3 (12%)	-
3	Chronic nonspecific mastitis (2)	2 (100%)	-	-	-
4	Breast abcess (2)	2 (100%)	-	-	-
5	Mixed carcinoma (Both ductal and lobular) (1)	0	-	1(100%)	-
6	Malignant phylloides tumour (1)	1 (100%)	-	-	-
7	Benign Phylloides tumour (1)	0	-	1(100%)	-
8	Invasive squamous cell carcinoma (1)	0	-	1(100%)	-
9	Lobular carcinoma (2)	2 (100%)	-	-	-
10	Mucinous adeno carcinoma (1)	1(100%)	-	-	-
11	Metaplastic carcinoma (1)	1(100%)	-	-	
	Total	**58 (89%)**	**0**	**6 (9%)**	**1 (2%)**

Table No. 9

SHOWING CORRELATION BEWTEEN TRUCUT BIOPSY AND HISTOPATHOLOGICAL EXAMINATION

Sl. No.	Histological Diagnosis	Trucut Biopsy			
		Correct Diagnosis	False Positive	False Negative	Insufficient
1	Fibroadenoma (28)	25 (89%)	-	-	3 (11%)
2	Ductal carcinoma (25)	24 (96%)	-	-	1 (4%)
3	Chronic nonspecific mastitis (2)	2 (100%)	-	-	-
4	Breast abcess (2)	2 (100%)	-	-	-
5	Mixed carcinoma (Both ductal and lobular) (1)	0	-	1(100%)	-
6	Malignant phylloides tumour (1)	1 (100%)	-	-	-
7	Benign Phylloides tumour (1)	0	-	1(100%)	-
8	Invasive squamous cell carcinoma (1)	1 (100%)	-	1(100%)	-
9	Lobular carcinoma (2)	2 (100%)	-	-	-
10	Mucinous adeno carcinoma (1)	1 (100%)	-	-	-
11	Metaplastic carcinoma (1)	1 (100%)	-	-	
	Total	**59 (91%)**	**0**	**2 (3%)**	**4 (6%)**

RESULTS

FNAC gave correct diagnosis in 89%, while in 6 cases the result was false negative and in 1 case no opinion could be made.

The sensitivity of FNAC is 90% and specificity is 100%. The positive predictive value is 100% while negative predictive value is 90%. In 1 patient, unsatisfactory smear obtained, which was not taken for account for analysis. Overall accuracy of FNAC is 98% and that of TCNB is 97%.

TCNB gave the correct diagnosis in 91%, 2 false negative cases with 4 cases the biopsy was inadequate to give any diagnosis. The sensitivity and specificity of TCNB was 96% and 100% respectively. Similarly positive predictive value was 100% and 96% respectively. In 4 cases, inadequate material obtained.

DISCUSSION

All agree on the necessity for prompt diagnosis of any breast lump. Hence workers all over the world are in search of a method which can give an early as well as an accurate diagnosis. The incision or excision biopsy in a well accepted diagnostic method for breast lump, but both procedures are traumatic and require operation theatre facilities. In the recent years, much of emphasis is laid on FNAC[42]. Trucut needle is a simplified needle and needle biopsy can be performed in out patient services.

FNAC is used extensively in the diagnosis of any lump. The high rate of false negative diagnosis is early reports and seedling of the cells along the needle track were the reasons that thought. Martin and Ellis introduced the technique in 1934, it was not well accepted. The visit of tumour dissemination has been shown to be more in surgical biopsy as compared to FNAC. The false negative result in cancer of the breast is 0-10 %. The present study had the same false negative rate.

The reason for false negative diagnosis is due to number of factors which include dense fibrosis of the tumour (failure to pierce the tumour) and erroneous interpretation.

The correct diagnosis by FNAC[5] can be achieved in 80-95% cases. In the present series the correct diagnosis by FNAC in 89% cases. There are many advantages of FNAC as it saves hospital admission, saves preliminary biopsy, saves frozen section and the patient known beforehand the type of operation.

Further, it allows rationale planning of operation list and avoid unnecessary admissions. It can be carried out as an out patient procedure with minimal trauma to the patient, can be repeated at ease and mentally prepares the patient and surgeon.

Further, it provides and opportunity of follow up the patient with clinically benign lesions without surgery.

In a busy out patient department and in busy operation list, the surgical biopsy is a time consuming process. So cutting needle biopsy provides an easier and time saving alternative.

The vim Silvermann's needle was first used in 1960 in diagnosis of the breast cancer. An excisional biopsy has several disadvantages as it requires general anaesthesia and affects the choice of incision for definitive surgery. TCNB[34] is safe and simple

technique. The patients acceptance is high and apart from mild brushing no complication has been encountered.

On positive diagnosis of malignancy by TCNB[4], a definitive surgery can be planned as no false positive results are reported by this techniques. In the present study, there were 2 false negative cases and in 4 cases, the biopsy material, inadequate to give any diagnosis. The success rate of needle biopsy depends upon the size and consistency of the lump and the type of needle used.

In fatty obese patients, where the breast is bulky, the needle may miss the lesion. The trucut needle has the advantages on the other needles as it quite handy, cuts a good core of tissue with least trauma to the patient.

Both the technique have their own advantages and draw backs. FNAC[11] is the most simple techniques and does not require any special instrument and the result can be obtained in a few hours time. FNAC is associated with false positive and false negative results and because of this, still it is controversial to decide the final surgery based only on the results of FNAC.

The result of FNAC[19] should be correlated with the clinical impression. TCNB is a histological diagnosis while FNAC is cytological diagnosis where one has to report on few cells. As there

are no false positive results with TCNB so once a diagnosis of malignancy is established. One can go for the definitive surgery. TCNB[44] is comparatively more traumatic than FNAC as it may sometime bruise the breast.

On comparing the results of both techniques, it was found that in benign, correct diagnosis was maximum of FNAC (94%) and TCNB (88%), while in malignancy by FNAC and TCNB correct diagnosis was 84% and 94% respectively. Taking all the techniques together, diagnosis could be reached in 90% of cases.

COMPARISON OF STUDY

Table No. 10

Studies	No. of cases	FNAC				TCNB			
		Sen	Spe	Acc	P Value	Sen	Spe	Acc	P Value
NS Yong (Singapore Medical College)	39	84 to 97.5	99 to 100	90	<0.02	90	100	67	<0.02
Present study	65	90	100	98	0.016	96	100	97	0.031

The accuracy of FNAC and TCNB are 98% and 97% respectively. The difference beings statistically significant with a $p<0.02$. P value of FNAC and TCNB are 0.016 and 0.031 respectively, using **McNemar test** for paired data, which shows both the tests are significant with FNAC most significant compared to TCNB.

CONCLUSION

This study has helped to correlate cytological report, trucut needle biopsy and histopathology. Further out patient assessment of breast lumps was done for the period of 2005 – 2006 in our hospital.

The results of this study showed almost equal detection rates by FNAC (89%) and trucut biopsy (91%) when comparing with histopathological examination. Trucut biopsy[29], however was able to give a histological diagnosis and results correlated 100% with the final histology. However, in the setting of an out patient clinic, we would like to recommend the use of FNAC for the diagnosis of suspicions breast lumps. With the results we would be able to advise the patient and recommend further treatment. However there is need for an excision biopsy to obtain a definitive histology before proceeding to definitive surgery as more have been cases of false positive results for FNAC.

Considering both techniques, it can be concluded that if FNAC[37] can find a diagnosis one can go ahead with a definitive operation. But, if in a clinically suspected case, FNAC is negative then one should go for further investigation. In this concern the TCNB is

ideal for getting the histological report. Even if TCNB report comes out to be negative, one should proceed with excisional or incisional biopsy and according histopathological report, patient can be planned for further treatment (surgery).

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PROFORMA

Case No :

Name :

Age :

IP No :

Ward :

Unit :

Duration :

Complaints :

Presenting illness : Unilateral / Bilateral

Pain : Yes / No

Discharge : Yes / No – Serous / Blood / Green

Lump : Yes / No

Personal History :

Married / Unmarried :

Menarche :

No. of Children :

Breast Fed :

Breast Examination :

Nipple & Areola : Normal / Raised

Prominent / Flattened / Retracted

Fissure / Crack / Eczema

Skin over the Breast : Normal / Dimpling /

Retraction / Puckering

Sweeling :

Location :

Size :

Shape :

Surface :

Margin :

Consistency :

Fixity :

Provisional Diagnosis :

FNAC :

Trucut Needle Biopsy :

Excision Biopsy :

Final Diagnosis :

CONSENT FORM

Patient Name :

Age / Sex :

IP No. :

Unit / Ward :

Diagnosis :

As I have lump in the breast, I am willing to undergo for tissue biopsy by FNAC and trucut biopsy.

Patient's Signature

Xg;g[jy; gotk;

nehahspapd; bgah; :

taJ / ghypdk; :

kUj;Jtkid vz; :

a{dpl; / thh;L :

nehahspapd; tpguk; :

vdJ khh;gfj;jpy; fl;o cs;sjhy;/ mjid Crp \yk; rij ghpl;ir bra;J bfhs;s rk;kjpf;fpnwd; (FNAC & Trucut Biopsy).

nehahspapd; ifbaGj;J

MASTER CHART

Sl. No.	Name	Age	Unit / Ward	Inpatient Number	Period	Lump Location	Lump Size	FNAC	Trucut Biopsy	Excision Biopsy	Final Diagnosis	Procedure
1	Kaveri	36	FSIII/SV	3741	Jan 2005	® lower outer	5x4	Ductal Ca	Ductal Ca	Invasive ductal ca	® Ca breast	® MRM
2	Nagamani	20	FSII/SI	3360	Jan 2005	(L) upper inner	2x2	Fibro adenoma	Fibro adenoma	Fibro adenoma pericanalicular	(L) Fibro adenoma breast	® Excision
3	Dhanalakshmi	25	FSII/SIII	7631	Jan 2005	(L) lower inner	3x4	Fibro adenomatoid hyperplasia	Fibro adenoma	Fibro adenoma – intracanalicular	(L) Fibro adenoma breast	Excision
4	Anushiya	40	FSII/SIII	2928	Feb 2005	® upper inner	4x3	Ductal Ca	Ductal Ca	Mixed Ca – both ductal and lobular Ca	® Ca breast	® MRM
5	Kamalathal	60	FSII/SIII	5475	Feb 2005	® upper outer	5x6	Ductal Ca	Ductal Ca	Invasive Ductal ca	® Ca breast	® MRM
6	Sarojini	35	FSII/SIII	3006	Feb 2005	® upper outer	4x3	Ductal Ca	Ductal Ca	Invasive Ductal ca	® Ca breast	® MRM
7	Vijaya	37	FSII/SII	4217	Feb 2005	(L) upper inner	3x2	Fibro adenoma	Fibro adenoma	Fibro adenoma pericanalicular	(L) Fibro adenoma breast	(L) Excision
8	Maragatham	23	FSIII/SV	9007	Mar 2005	® upper inner	3x2	Inadequate kindly rpt	Fibro adenoma	Fibro adenoma pericanalicular	® Fibro adenoma breast	® Excision
9	Syamala	40	FSIII/SIV	9961	Mar 2005	(L) upper inner	4x4	Ductal Ca	Ductal Ca	Ductal ca	(L) Ca breast	(L) MRM
10	Renuka	38	FSIII/SV	9977	Mar 2005	® upper inner	4x4	Ductal Ca	Ductal Ca	Ductal ca	® Ca breast	® MRM
11	Karupathal	55	FSIII/SIV	10867	Mar 2005	® lower inner, central	5x6	Ductal Ca	Ductal Ca	Ductal ca	® Ca breast	® MRM
12	Chellammal	35	FSIII/SIV	10684	Mar 2005	® lower outer	3x2	Fibro adenoma	Fibro adenoma	Fibro adenoma pericanalicular	® Fibro adenoma breast	® Excision
13	Kamalam	23	FSIII/SIV	10553	Mar 2005	® upper inner	2x3	Fibro adenoma	Fibro adenoma	Fibro adenoma pericanalicular	® Fibro adenoma breast	® Excision

Sl. No.	Name	Age	Unit / Ward	Inpatient Number	Period	Lump Location	Lump Size	FNAC	Trucut Biopsy	Excision Biopsy	Final Diagnosis	Procedure
14	Chithra	29	FSIII/SV	11792/05	Mar 2005	® lower outer	6x5	Fibrocystic changes	Fibro cystic changes	Fibrocystic disease with chronic mastitis	® Fibrocystic disease with mastitis	® Excision
15	Eswari	25	FSIII/SIV	11240	Mar 2005	(L) upper outer	3x4	Fibro adenoma	Ductal carcinoma	Ductal carcinoma	(L) Ca breast	(L) MRM
16	Velathal	45	FSIII/SIV	12188	Mar 2005	® lower inner	4x6	Ductal ca	Ductal ca	Invasive ductal carcinoma	® Ca breast	® MRM
17	Kullayee	50	FSIII/SIV	12186	Mar 2005	All quadrants	8x8	Phyllodes tumour	Phyllodes tumour	Phyllodes tumour – low grade sarcomatous transformation	(L) malignant phylloides tumour	(L) MRM
18	Preethamercy	23	FSIII/SIV	20347	Apr 2005	(L) lower outer	1x1	Fibro adenoma	Fibro adenoma	Fibroadenoma pericanalicular type	(L) fibro adenoma	(L) Excision
19	Rajalakshmi	19	FSIII/SIII	16574	Apr 2005	® lower inner	2x2	Fibro adenoma	Fibro adenoma	Fibroadenoma pericanalicular type	® fibro adenoma	® Excision
20	Balkies	55	FSIII/SIV	16960	Apr 2005	(L) upper inner	5x4	Ductal carcinoma	Invasive ductal carcinoma	Invasive ductal carcinoma	(L) Ca breast	(L) MRM
21	Vanjiyammal	60	FSIII/SIV	17600	Apr 2005	® upper outer, central	6x4	Ductal carcinoma	Ductal carcinoma	Invasive ductal carcinoma	® Ca breast	® MRM
22	Ambiga	20	FSIII/SIV	17577	Apr 2005	® upper inner	3x3	Fibro adenoma	Fibro adenoma	Fibro adenoma intra canalicular	® fibro adenoma	® Excision
23	Arammal	50	FSIII/SIV	27355	May 2005	® upper inner, central	5x4	Atypical cells	Ductal carcinoma	Invasive ductal carcinoma	® Ca breast	® MRM
24	Suganthi	35	FSIII/SV	26285	May 2005	Central quadrant	5x4	Ductal ca	Ductal carcinoma	Invasive ductal carcinoma	® Ca breast	® MRM
25	Jothimani	55	FSIII/SIV	31722	June 2005	(L) upper outer	2x2	Fibroadenoma / fibroadenomatoid hyperplasia	Fibroadenoma / fibroadenomatoid hyperplasia	Fibro adenoma mixed type	(L) fibro adenoma	(L) Excision

Sl. No.	Name	Age	Unit / Ward	Inpatient Number	Period	Lump Location	Lump Size	FNAC	Trucut Biopsy	Excision Biopsy	Final Diagnosis	Procedure
26	Gomathi	25	FSIII/SIV	34821	June 2005	(L) upper inner	3x2	Fibro adenoma	Inadequate	Fibroadenoma pericanalicular type	(L) fibro adenoma	(L) Excision
27	Nagarathinam	46	FSIII/SIV	31280	June 2005	(L) upper inner	2x3	Fibro adenosis	Fibrocystic disease	Fibrocystic disease	(L) fibro adenoma	(L) Excision
28	Kaliammal	55	FSIII/SIV	38548	June 2005	(L) upper outer, inner	5x6	Atypical cells	Ductal ca	Invasive ductal ca	(L) Ca breast	(L) MRM
29	Asma Begum	22	FSIII/SIV	37567	June 2005	® upper inner (O) upper outer	2x1 2x2	B/L fibro adenoma	B/L fibroadenoma	B/L fibroadenoma perinalicular type	B/L fibroadenoma	Excision
30	Saraswathy	30	FSIII/SIV	38798	June 2005	® central	3x2	Ductal carcinoma	Invasive squamous cells ca	Invasive squamous cell ca	® Ca breast recurrent	® recurrent nodule excision
31	Parvathy	35	FSIII/SIV	37891	June 2005	(L) upper inner	3x4	Fibro adenoma	Fibro adenoma	Fibro adenoma intracanalicular tupe	(L) fibro adenoma	Excision
32	Palaniammal	40	FSIII/SIV	38469	June 2005	® upper outer, central	5x6	Ductal carcinoma	Ductal carcinoma	Invasive ductal ca	® Ca breast	® MRM
33	Mymoon	57	FSIII/SIV	36885	July 2005	® lower inner and (L) central	2x2 3x4	® Atypical cells (L) Inadequate	® lobular ca (L) lobular ca	B/L lobular ca	(L) recurrent ca breast and ® ca breast	(L) recurrent nodule excision and ® MRM
34	Shanthi	36	FSIII/SIV	34067	July 2005	(L) upper inner	2x2	Inadequate	Fibro adenoma	Fibroadenoma perinalicular type	(L) fibro adenoma	Excision
35	Subbulakshmi	30	FSIII/SIV	36738	July 2005	® lower inner	4x3	Ductal carcinoma	Ductal carcinoma	Invasive ductal ca	® ca breast	® MRM
36	Indira	34	FSIII/SIII	32247	July 2005	(L) lower outer	4x3	Fibro adenoma	Fibro adenoma	Fibro adenoma mixed	(L) fibro adenoma	Excision

Sl. No.	Name	Age	Unit / Ward	Inpatient Number	Period	Lump Location	Lump Size	FNAC	Trucut Biopsy	Excision Biopsy	Final Diagnosis	Procedure
37	Ammaniyammal	55	FSIII/SIV	35140	July 2005	All quadrants	8x6	Ductal carcinoma	Invasive ductal carcinoma	Infiltrating ductal ca	(L) Ca breast	(L) MRM
38	Subaitha	55	FSIII/SIV	36754	July 2005	® upper inner	5x6	Infiltrating ductal carcinoma	Invasive ductal carcinoma	Infiltrating ductal ca	® Ca breast	® MRM
39	Muniamma	42	FSIII/SIV	36711	July 2005	® lower outer	4x5	Ductal carcinoma	Mature apipocytes thin fibrous septa	Invasive ductal ca	® Ca breast	® MRM
40	Ramija	32	FSIII/SIV	36712	July 2005	(L) upper outer	6x6	Fibro adenoma	Fibrosis and cystic dilatation of ductules	fibroadenoma perinalicular with fibrocystic change	(L) fibroadenoma and fibroystic disease	(L) Excision
41	Malliga	34	FSIII/SIV	34618	July 2005	(L) upper inner	3x2	Atypical cells	Abundant mucinous material	Mucinous adeno carcinoma	(L) Ca breast	(L) MRM
42	Nazeera	19	FSIII/SIV	36748	July 2005	® upper ouer	5x5	Fibro adenoma	Fibro adenoma breast	Fibro adenoma mixed	® fibro adenoma	® Excision
43	Karupathal	21	FSIII/SIII	32368	July 2005	® upper outer	5x3	Fibro adenoma	Fibro adenoma	Fibro adenoma mixed	® fibro adenoma	® Excision
44	Dhanalakshmi	49	FSIII/SIV	38720	Aug 2005	® lower outer	2x3	Abcess	Inadequate	Abcess	® breast abcess	I & D
45	Joy	31	FSIII/SIV	38785	Aug 2005	(L) upper outer, inner	6x5	Ductal ca	Ductal ca	Invasive ductal ca	(L) Ca breast	(L) MRM
46	Angathal	55	FSIII/SIV	33888	Aug 2005	® upper inner	4x4	Fibrocystic disease	Fibrocystic disease	Phylloides tumour – benign	® Benign phylloides tumour	® Excision
47	Roja	35	FSIII/SIII	32748	Aug 2005	® upper outer	3x2	Atypical cells	Lobular ca	Lobular ca	® Ca breast	® MRM
48	Chandra	58	FSIII/SIV	36731	Aug 2005	® Central, upper, outer	5x4	Atypical cells	Ductal carcinoma	Invasive ductal ca	Recurrent Ca breast	® recurrent nodule excision

Sl. No.	Name	Age	Unit / Ward	Inpatient Number	Period	Lump Location	Lump Size	FNAC	Trucut Biopsy	Excision Biopsy	Final Diagnosis	Procedure
49	Kamala	20	FSIII/SV	32087	Sep 2005	® upper inner	2x1	Fibro adenoma	Fibro adenoma	Fibro adenoma pericanalicular type	® fibro adenoma	(L) Excision
50	Lakshmiammal	60	FSIII/SIV	32067	Sep 2005	(L) lower inner	2x2	Ductal carcinoma	Ductal carcinoma	Invasive ductal ca	(L) Recurrent Ca breast	(L) Excision
51	Solaiyammal	65	FSIII/SIV	46587	Sep 2005	(L) upper outer, inner	5x6	Ductal carcinoma	Ductal carcinoma	Invasive ductal ca	(L) Ca breast	(L) MRM
52	Gunalakshmi	50	FSIII/SIV	54662	Oct 2005	(L) lower outer	5x4	Fibro adenomatoid hyperplasia	Fibrocystic disease	Fibrocystic disease of breast	(L) fibro cystic disease	(L) Excision
53	Paruleshanishia	18	FSIII/SIV	58925	Oct 2005	® upper inner	2x3	Fibro adenoma	Thin strip of fibrous tissue only	Fibro adenoma pericanalicular type	® fibro adenoma	® Excision
54	Thoulathnisha	18	FSIII/SIV	58993	Nov 2005	® lower outer	2x2	Fibro adenoma	Fibro adenoma	Fibro adenoma intranalicular type	® fibro adenoma	® Excision
55	Mani	39	FSIII/SIV	53029	Nov 2005	® upper outer	3x2	Fibro adenomatoid hyperplasia	Ductal carcinoma	Invasive ductal ca	® ca breast	® MRM
56	Saroja	43	FSIII/SIV	63892	Dec 2005	(L) upper inner	4x5	A typical cells	Squamous cell ca	Metaplastic ca	(L) Meta plastic ca breast	(L) MRM
57	Rajammal	40	FSIII/SIV	64787	Dec 2005	® upper inner	4x4	Fibrous tissue proliferation with lymphoid aggregates	Chronic nonspecific mastitis	Chronic nonspecific mastitis	® Chronic nonspecific mastitis	Conservative treatment
58	Kaliayammal	55	FSIII/SIII	66568	Dec 2005	(L) lower outer	3x2	Abcess	Mastitis with necrotic material	Suggestive of abcess	(L) breast abcess	I & D
59	Amaravathy	24	FSIII/SIV	65798	Dec 2005	® upper inner	2x3	Fibro adenoma	Inadequate specimen	Fibro adenoma intracanalicular	® fibro adenoma	Excision
60	Tamilarasi	38	FSIII/SIV	63972	Dec 2005	(L) lower outer	3x2	Atypical cells	Ductal ca	Invasive ductal ca	(L) Ca breast	(L) MRM

Sl. No.	Name	Age	Unit / Ward	Inpatient Number	Period	Lump Location	Lump Size	FNAC	Trucut Biopsy	Excision Biopsy	Final Diagnosis	Procedure
61	Jayamani	37	FSIII/SIV	9774	Jan 2006	(L) upper outer	2x3	Fibro adenoma	Fibro adenoma	Fibro adenoma intracanalicular	(L) Fibro adenoma	(L) Excision
62	Sangeetha Mary	21	FSIII/SV	9146	Jan 2006	® upper inner	2x3	Fibro adenoma	Fibro adenoma	Fibro adenoma perinalicular	® Fibro adenoma	® excision
63	Sumithra	21	FSIII/SIV	9889	Jan 2006	® lower inner	2x3	Fibro adenoma	Fibro adenoma	Fibro adenoma – mixed	® Fibro adenoma	® excision
64	Vijaya	30	FSIII/SIII	9558	Jan 2006	® upper inner	2x3	Fibrocystic disease with atypical cells	Fibro adenoma	Fibro adenoma perinalicular	(L) Fibro adenoma	(L) Excision
65	Patchiyammal	45	FSIII/SVI	4555	Jan 2006	® upper outer	4x2	Ductal ca	Ductal ca	Invasive ductal ca	® Ca Breast	® MRM