

## Fine needle aspiration cytology versus trucut biopsy in the diagnosis of breast cancer- A comparative study

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### Abstract

**Background:** Most diseases of the breast present as a palpable mass. The majority of breast lesions are not malignant, and most benign lesions do not progress to cancer; however the accuracy of diagnosis can be increased by a combination of preoperative tests like physical examination, mammography, fine-needle aspiration cytology (FNAC), and Tru cut needle biopsy (TGNB) or core needle biopsy (CNB). FNAC has grown in popularity and became the first initial used procedure after history taking and clinical examination for diagnosis of solid and cystic breast lumps. This study was designated to investigate the accuracy of FNAC in comparison to TCNB for diagnosis of breast masses.

**Design:** Retrospective Study

**Materials & Methods:** In this study, 62 patients having breast lumps were studied during the period from January 2014 to January 2017 in terms of FNAC and Trucut Biopsy and were compared with tissue diagnosis. Variables like age, marital status, duration, size, menstrual status & site were analyzed using statistical analysis.

**Results:** Out of 62 patients with breast lump, 32 were diagnosed with Benign Breast lesions, and 30 with malignant lesions. Sensitivity of FNAC and TRUCUT biopsy were 84.34% and 97.1% respectively. TRUCUT was more accurate when compared to FNAC.

**Keywords:** FNAC, trucut biopsy, breast lump, mammography, malignancy, tissue diagnosis.

### 1. Introduction

Breast cancer is the one of the most researched cancer across the world and new advancements for the treatment are coming up frequently. Breast cancer in India is achieving Endemic proportions now. Breast is host to many diseases which range from benign and malignant neoplasm's, inflammatory conditions to infections, most of which present as lumps in the breast. Breast lumps are one of the commonest complains encountered in surgical OPD's which makes it important to differentiate between benign and malignant conditions before treating it. The successful diagnosis of the disease is based on a thorough understanding of normal anatomy, physiologic and pathologic features of the breast. It accounts for 20-30% of all the cancers in the world.[1] The treatment of the

advanced stages is often futile making early diagnosis a prime concern in the medical field. Lack of awareness and screening programs makes the uneducated individuals oblivious to the disastrous disease.

Various diagnostic methods have been developed to evaluate the breast lumps with the goal of identifying a sensitive, specific, efficient and economical approach to diagnose breast cancer. Physical examination, mammography, Tru-cut biopsy (Core needle biopsy), ultrasonography, thermography, FNAC, open excision biopsy are all used to greater or lesser extent in diagnostic workup of a palpable breast mass.[2]

FNAC has been used since a long time for this purpose, along with clinical examination and

mammography. It has been proved to be of great value in the diagnosis of breast lumps, apart from being cost effective, it is also simple and quick while providing the cytological diagnosis.[3] FNAC is often used as a first priority investigation in patients with breast lump. However, it has certain limitations like inability to differentiate between invasive and in situ carcinomas, insufficient samples and false negative results.

Tru-cut biopsy also known as core needle biopsy is now one of the useful means of obtaining histopathological diagnosis. It is relatively easy and can be performed on an outpatient basis. It also avoids unnecessary excisional biopsy. Lower inadequacy rates, allowing of ancillary methods, grading and typing of cancer, are the features which help to plan a definitive surgery.

There is controversy in literature about the role of FNAC and Core needle biopsy in management of breast lesions. Some studies favor FNAC over Core Needle Biopsy, while others criticize the use. Some authors recommended combining the two techniques.[4]

The aim of this study was to compare the results of FNAC and Trucut Biopsy with Final Histopathology in detection of breast lump pathology in our local context.

### 1.1 Objectives

1. To find out the diagnostic accuracy of FNAC and trucut biopsy as compared to the final histopathologic report in breast lumps.
2. To compare the diagnostic accuracy of FNAC and trucut biopsy in differentiating the benign and malignant lesions of palpable breast lumps.

## 2. Materials and methods

This was a retrospective study which included sixty two patients who presented to the outpatient department with breast lump and subsequently admitted and treated in all surgical units in R L Jalappa Hospital, Tamaka, Kolar, between January 2014 and January 2017. Clinical details were archived from the case files.

All female patients above 20 years of age with clinically palpable breast lump were included in the study. Patients below 20 years of age, patients with breast lump who are not taken up for surgery, patients non-compliant for FNAC or Tru-cut biopsy, Male patients were excluded from the study.

### 2.1 FNAC

The following equipment is used for Fine Needle Aspiration Cytology:

1. 10 ml disposable syringes.
2. 22 gauge disposable needles.
3. 95% ethanol.
4. Spirit swabs.
5. Glass slides.

### 2.2 Technique

The breast lump is fixed between 2 fingers. After observing aseptic precautions, a 22-24 gauge disposable sterile needle with 10ml disposable syringe is used to enter the swelling and multiple passes given. Smears are made, air dried and wet fixed, stained with Giemsa stain and Haemotoxylin and Eosin stains.

### 2.3 Tru-Cut Biopsy

Equipment required:

1. Tru-cut gun with an 18-gauge needle.
2. Sterile container with formalin.

### Technique

After manual localization and immobilization of the lesion, under complete aseptic technique a 2% Lignocaine infiltrating anesthetic was administered and the skin incision performed. A biopsy specimen was obtained by means of four successive insertions with different angulations of the needle into the core of the lesion. The quantity and quality of the material obtained was judged after immediate immersion of the specimen in fixative, and then specimen was sent to histopathology department.

## 3. Results

In the present study female patients with breast carcinoma were aged between 3rd and 8th decade of life. The youngest was 25 years and oldest 79 years, the mean age was 52.66 years. Majority (63%) were in age group of 40 to 59 yrs. (Table 1)

**Table 1: Age Distribution of Patients:**

Age Group (In Years)	Number of Cases
<30	1
30-39	8
40-49	14
50-59	19
>=60	20

Out of 62 patients, 32 breast lumps were benign, and 30 breast lumps were malignant. (Table 2)

Of 32 breast lumps with benign lesions 24 (75%) were married. Of 30 malignant breast lumps 28 (93.3%) were married. (Table 3)

**Table 2: Malignant v/s Benign:**

Total Cases	Malignant	Benign
62	30	32

**Table 3: Breast disease v/s Marital status:**

Disease	Married	Unmarried
Benign	24 (75%)	8 (25%)
Malignant	28 (93.3%)	2 (6.66%)

For Malignant Disease, FNAC showed sensitivity and specificity of 84.35% and 100% respectively. In 5 cases, results were false negative by FNAC. Positive predictive value was 100% while Negative predictive value by FNAC was 84.1%

Sensitivity and specificity of trucut biopsy was 97.1% and 100% respectively. Also positive predictive value was 100% and negative predictive value was 96.8%. The results of trucut biopsy well correlated with final histopathology report than FNAC.

**Table 4: Histopathology Report of Benign Breast Lesions:**

Fibroadenoma	22
Fibrocystic Disease	8
Serocystic Disease	2

The morphological categories were infiltrating ductal carcinoma, not otherwise specified (52 cases- 83.9%) followed by medullary carcinoma (6 cases, 9.7%); infiltrating lobular carcinoma (2 cases- 3.2%); mucinous carcinoma and infiltrating papillary carcinoma 1 (0.7%) case each. (Table 2)

**Table 5: Histopathology Report of Malignant Breast Lesions**

Morphological categories	Number of cases
Infiltrating ductal carcinoma	52
Medullary carcinoma	6
Mucinous carcinoma	1
Infiltrating lobular carcinoma	2
Infiltrating papillary carcinoma	1

## 4. Discussion

The ideal approach for women with suspicious breast lump is the triple assessment approach including clinical, cytology, and mammography, but this assessment is not sufficient for decision of treatment, because FNAC reports still have percentage of uncertainty, also lack important information about the histopathological type, grade, receptors, and intrinsic behavior of the tumor. All of this information is of great importance for correct preoperative evaluation by both surgeon and oncologist.

Williams *et al* (2011) in their study titled- "Diagnosis of breast lesions: fine needle aspiration cytology or core needle biopsy? A review" concluded that in experienced hands, the sensitivity of FNAC is high, and not much lower than CNB. The specificity of CNB is, however, higher as well as the positive predictive value for suspicious and especially atypical lesions and fibro epithelial lesions. Also, the inadequacy rate of FNAC for non-palpable lesions, the incidence of which has increased as a result of widely used screening programmes, is higher than for CNB. So, the overall performance indices of CNB are superior to FNAC in the majority of breast lesions.[5]

FNAC is a well accepted procedure in developing countries due to its low cost, safe and affordable with rapid results, pain is minimal and no further care is needed. This requires an excellent aspirator to obtain satisfactory material and breast cytopathologic expertise in interpreting breast aspirates.

Memon Farzana, Sajida Qureshi *et al* (2009) from Pakistan supported that the sensitivity of core biopsy (84.62%) is more than that of FNAC (80.71%) in their study of 52 samplings, in which all the patients underwent FNAC followed by core biopsy.[6]

Bukhari *et al* (2011) in their research "Use of fine needle aspiration in evaluation of breast lumps" in 425 patients over a period of 4 years strongly suggested that the cytological examination of breast lesions prior to surgical treatment serves as a rapid, economical and valuable diagnostic tool.[7]

Many studies confirmed the usefulness of a systematic use of core biopsy for diagnosis of breast cancer, even when good quality clinical, radiological and histological examinations together are undertaken. The trucut biopsy of palpable breast lesions based on histological study of tissue specimens can provide all the reliable information. Core biopsy permits a preoperative knowledge of the histological type and prognostic parameters (receptor status, proliferative activity, ploidy, and expression of oncogenes and antioncogenes such as c-erbB-2 and p53), so tru-cut biopsy will guide the surgeon and the oncologist for ideal modern therapeutic strategy in surgical decision making.[8] It also permits the eventual use of neoadjuvant therapy.

For small non palpable lesions in breast lumps, Trucut Biopsy has replaced FNAC because sample insufficiency is rare for trucut biopsy even for these lesions. Compared to open surgery, trucut biopsy is much less invasive. The volume of tissue removed, breast deformity, and the effect on mammography are much reduced. For non-palpable lesions surgery is omitted when the pathology is benign. For malignant lesions, surgery can be done in a single setting.

Thus Trucut biopsy can routinely be used as a part of triple assessment for suspicious breast lesions in developing countries. Its direct benefit is the avoidance of unnecessary surgery, frozen section, and axillary dissection. Cancer surgery is done as a single session in the majority of cases. It is well planned, with active participation by patients. Because this approach decreases significantly the price of diagnosis and treatment of breast cancer while fully respecting the patient's rights, there is no logic not to use it.

## 5. Conclusion

Both FNAC and Core Needle Biopsy are complimentary to each other and are useful in diagnosis of breast lesions. Both procedures have specific advantages and limitations. Core Needle Biopsy cannot replace FNAC, it is not needed to diagnose all breast lesions. It can be used as an adjunct in cases indecisive on cytology and those cases requiring biomarker studies.

In our study trucut was more accurate than FNAC. Trucut biopsy was able to give histological diagnosis and results correlated 100% with the final histopathological report. It also gives further information about tumor type, grade, lympho vascular invasion and receptor status. FNAC to evaluate a breast lump shows a high sensitivity, specificity and accuracy but trucut always provides a better histological diagnosis and more accurate.

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