

Comparative Study of FNAC and Trucut Biopsy for the Diagnosis of Palpable Breast Lumps

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Abstract

Introduction: Definitive diagnosis of patients who present with palpable breast lump is the need of the hour now a days. The method must be accurate, easy to perform and acceptable to the patient, can be carried out in a busy clinic setting and must not require too much preparation or expensive equipment.

Aims and Objectives: To compare fine-needle aspiration cytology and tru-cut biopsy in differentiating benign and malignant lesions of palpable breast lumps and to analyze sensitivity, specificity, positive and negative predictive values of fine-needle aspiration cytology and Trucut biopsy.

Materials and Method: It is a study conducted on 100 patients with palpable breast lump underwent FNAC and Trucut biopsy and compared with final histopathological confirmation.

Results: There were 100 patients who presented with breast lump during the study period. Out of a total 100 breast lump study, final diagnosis was 28 benign breast lump and 72 malignant breast lumps. Sensitivity of FNAC and TRUCUT biopsy were 94.4% and 100% respectively. While TRUCUT was more accurate when compared to FNAC.

Conclusion: Trucut biopsy is at par or superior to the FNAC by accurately detecting malignant lesions, providing information regarding local invasion, hormone receptors, and assist in immunohistochemistry, in turn helping direct appropriate treatment.

Keywords: FNAC, Trucut biopsy, breast lump, breast malignancy.

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Introduction

Breast cancer is topmost cancer among Indian females with an age-adjusted rate as high as 25.8 per 100,000 females [1].

FNAC is increasingly being used for the preoperative diagnosis of breast cancer and as a part of the "Triple test", But lacks important information about the histopathological type, grade, receptor status, and intrinsic behaviour of the tumor, important for correct pre-op evaluation. [2,3,4] Recently, Tru-cut biopsy has been introduced is considered superior to Fine Needle Aspiration Cytology (FNAC) as it provides sufficient tissue for pathologists to make an accurate diagnosis which can guide both surgeons and oncologists in designing appropriate therapeutic strategy for management of patients with breast lumps. This is also useful for both histological diagnosis and IHC evaluation. [5,6]

The study was undertaken to compare the results of FNAC and Trucut biopsy with final histopathology.

Aims and Objectives

1. To compare the diagnostic accuracy of fine-needle aspiration cytology and tru-cut biopsy in differentiating benign and malignant lesions of palpable lumps in the breast, with cytological and histopathological correlation.

2. To analyze sensitivity, specificity, positive and negative predictive values, and the efficacy of fine-needle aspiration cytology and Trucut biopsy.

Materials and Method

This was a prospective study of 100 cases operated for breast lumps in the surgical wards of Tertiary hospital of northern India after obtaining their written informed consent. The approval for the study was taken from the Institutional Ethics Committee.

Inclusion Criteria:

All cases in the age group of 18-80yrs with palpable breast lumps were included in the study.

Exclusion Criteria:

1. Patients with recurrent malignancy undergoing neoadjuvant therapy
2. Patients with breast lumps who are not taken up for surgery
3. Patients non-compliant for FNAC and Tru-cut biopsy
4. Patients with an acute and tender breast lump, like in a breast abscess
5. Frank malignant mass with skin ulceration

Data Collection:

A patient presenting to the department of surgery with a palpable breast lump is subject to a detailed clinical history with physical examination and the relevant information is entered in the proforma. After obtaining informed written consent from the patient, fine needle aspiration cytology and Tru-cut biopsy from the breast lump are performed after explaining the procedures to the patient.

FNAC: Equipment required:

- 1) 10ml disposable plastic syringe.
- 2) 22 Gauge disposable needles.
- 3) 95% ethanol.
- 4) Spirit swabs.
- 5) Glass slides.

Technique: - Under aseptic precautions, parts painted and draped. Under Local anesthesia, a needle was introduced into the breast lump. The specimen is withdrawn by aspiration with a syringe. Specimen sent for slide preparation, fixation, and cytological examination

TRU-CUT Biopsy: Equipment required:

- 1) Trucut gun with 18 gauge needle.

2) Sterile container with formalin.

Technique: - Parts painted and draped. - Application of local anesthesia - Manual localization and immobilization of the lesion - 5mm incision on the skin over the lesion using 11G needle.

Observations and Results

In this study, the total numbers of patients were 100. Out of a total of 100 breast lump aspirations, 32 breast lumps were benign and 68 breast lumps were malignant. Out of a total of 100 Trucut biopsies, 28 breast lumps were benign and 72 breast lumps were malignant. After the final histopathological diagnosis 100 cases in the study, 72 of the cases were found to be malignant and 28 were benign.

Out of the 100 women studied, the age group presenting to the OPD for a breast lump with the maximum frequency is 18-30yrs. It also shows that the prevalence of benign diseases is the most in the 18-30yrs group followed by 30-40yrs and for malignant diseases is in the 40-

50yrs, closely followed by the 50-60yrs age group.

From our study of 100 patients, we see that 97.5% of the malignant cases were in the post-menopausal group whereas there was an equal distribution of benign and malignant lesions in the pre-menopausal age group.

The 28 benign lesions and 72 malignant lesions confirmed on histology are arranged according to the frequency of their occurrence in this study [Table 1].

For malignant breast disease, FNAC showed sensitivity and specificity of 94.4% and 100% respectively. In 4 cases, results were false negative by FNAC. The positive predictive value was 100% while the Negative predictive value by FNAC was 96% [Table 2]. While the sensitivity and specificity of trucut biopsy were 100% and 100% respectively. Also, the positive predictive value was 100% and the negative predictive value was 100%. The results of trucut biopsy were well correlated with the final histopathology report than FNAC [Table 3].

Table 1: Histopathology report of benign and malignant breast lesions

Benign breast lesions	FREQUENCY	Malignant breast lesion	FREQUENCY
Fibroadenoma	26	Ductal Carcinoma (NST)	69
Fibrocystic change	2	Malignant Phyllodes	2
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Table 2: Sensitivity: 94.4%, Specificity: 100%, PPV- 100%, NPV-96%. Calculated from the table below:

FNAC	Malignant Breast Disease	Benign Breast Disease	TOTAL
POSITIVE	68	0	68
NEGATIVE	4	28	32
TOTAL	72	28	100

Table 3: Sensitivity: 100%, Specificity: 100%, PPV- 100%, NPV-100%. Calculated from the table below:

Trucut Biopsy	Malignant Breast Disease	Benign Breast Disease	TOTAL
POSITIVE	72	0	72
NEGATIVE	0	28	28
TOTAL	72	28	100

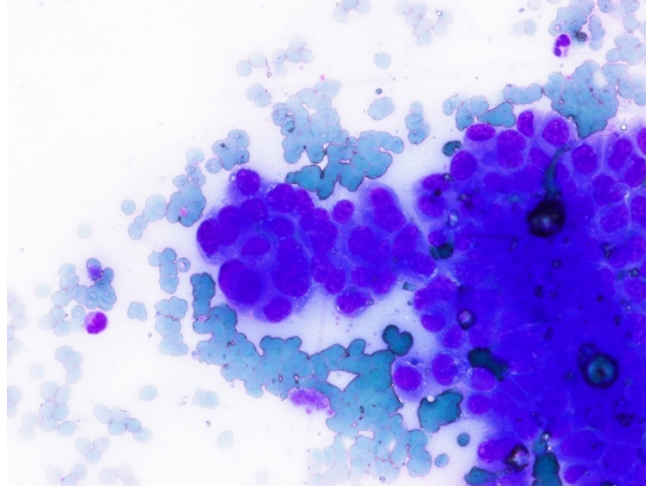


Figure 1: FNA Cytology picture of Fibroadenoma Breast.

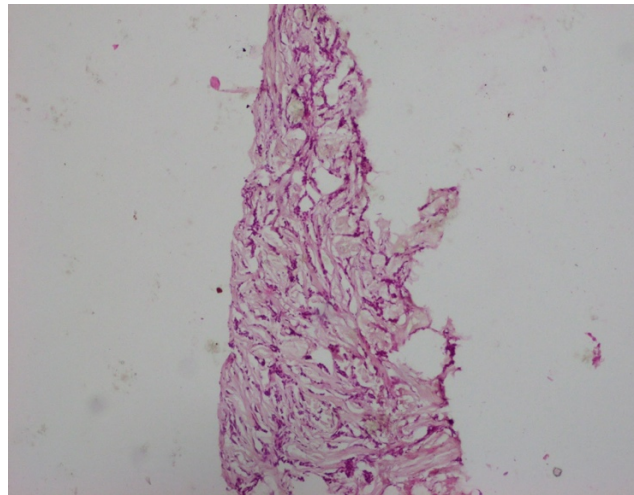


Figure 2: TRUCUT biopsy from breast lesion diagnostic of intra-ductal carcinoma.

Discussion

Patients with palpable breast lumps are common in OPDs and many are later diagnosed as malignant lesions. Hence, a prompt diagnosis must be made as early as possible, as further treatment is dependent on the same.

Our current research was performed on 100 female patients presenting with a palpable lump in the breast. FNAC was performed, followed by Trucut biopsy and a subsequent mastectomy or excision according to the reports. The final specimen was sent for histopathological diagnosis and the report was

correlated to that of the FNAC and the Trucut biopsy to observe how accurate FNAC was when compared to the Trucut biopsy in assessing the cystohistologic correlation.

The positive predictive value of FNAC to diagnose a malignant breast lesion was 100% and the negative predictive value was 87.5% in this study.

The positive predictive value of tru-cut biopsy in diagnosing a malignant breast lesion in our study was 100% and the negative predictive value was 100%.

The analysis of the cytological reports in various series confirms the high diagnostic accuracy of FNAC. The accuracy of FNAC for diagnosing benign breast lesions in our study was 96%, the overall sensitivity of FNAC in diagnosing a malignant lesion was 100%. There is a wide range of sensitivity (80-98.2%) and specificity (96-100%) in studies conducted all over the world regarding the FNAC. [7,10-14]

The analysis of the Trucut biopsy reports shows an even higher level of accuracy. The accuracy of Trucut biopsy for benign lesions was 100%. The overall sensitivity and specificity were both 100%. Also seen there is range of sensitivity (86.2-100%) and specificity (90-100%) in studies conducted all over the world regarding the Trucut biopsy. [7,11,12,14-17]

FNAC is a reliable, fast, cost-effective, and simple procedure for breast lump diagnosis. It is a valuable method despite being moderately less sensitive than Trucut biopsy. Few advantages noted with Trucut biopsy were that it preoperatively provided the histologic type of tissue, and valuable information on prognostic parameters such as expression of oncogenes and anti-oncogenes (c-erbB2 & p53), receptor status, proliferative activity, and ploidy[7,8]. This enables the oncologist and surgeon to choose the ideal therapeutic measure with appropriate neoadjuvant chemotherapy. Mitra et al. stated that a combined method of FNAC and Trucut biopsy gives better accuracy, sensitivity, and specificity, also reducing the false positives, by following an algorithm[9].

Summary and Conclusion

The accuracy rate of Trucut biopsy was found to be higher than that of FNAC in our study.

FNAC cannot tell us about the treatment modality to be followed for an individual patient, but Trucut biopsy enables us to assess the histochemistry, which in turn helps direct management. In our study, Trucut biopsy has

100% sensitivity, specificity, PPV, NPV, and accuracy with no false negatives or false positives.

To conclude, the results indicate that Trucut biopsy is at par or superior to the FNAC, since it overshadows the FNAC by accurately detecting malignant lesions, providing information regarding local invasion, hormone receptors, and assist in immunohistochemistry, in turn helping direct appropriate treatment.

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