

## A Comparison of Fine Needle Aspiration Cytology (FNAC) with Tru-cut Biopsy in Breast Lump Patients Taking Histopathology as Gold Standard

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### Abstract

**Objective:** To compare sensitivity and specificity of FNAC with Tru-cut biopsy diagnosis of breast lump patients.

**Material and Methods:** It was a cross sectional study conducted at surgical department of Gulab Devi Teaching Hospital Lahore from January 2022 to December 2022. A total of 122 patients presented in surgical OPD with complaints of breast lump of size between 2cm to 4 cm were included in the study with their consent. All these patients underwent FNAC, true cut biopsy and excisional biopsy. Sensitivity and specificity of both FNAC and true cut were calculated.

**Results:** Mean age of patients included in this study was  $35.4 \pm 14.6$  years. The sensitivity and specificity of FNAC in benign breast diseases was 98.2% and 74.2% respectively while in malignant diseases it was 72.7% and 98.8% respectively (p-value 0.00). The sensitivity and specificity of Tru-cut in breast diseases was 100% and 97.1% respectively while in malignant diseases it was 97% and 98.2% respectively (p-value 0.00).

**Conclusion:** Breast lump is more common in females as compared to males. Breast carcinoma is more common in old females and benign breast diseases is common among young females. Tru-cut biopsy is better than FNAC in diagnosis of both benign and malignant lesions of breast lumps.

**Keywords:** Breast lump, FNAC, TRU CUT

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### Introduction

A common issue encountered in surgical practice among female patients is the presence of a lump in the breast. Breast lumps can range from simple cysts to benign tumors and malignancies. The diagnosis can be made more accurate by combining preoperative history, clinical examination and tests which includes FNAC, TRU CUT biopsy and ultrasound/mammography

depending on age of patient.<sup>1</sup> The breasts are present on anterior thoracic wall ranging from clavicle to fifth intercostal space. They are more prominent in females as compared with males. In females, breasts consists of mammary glands. Each breast has 15 to 20 lobes. These lobes looks like spokes of wheel as they surround the nipple. Each lobe contains lobules which are bulblike glands present at the end to produce milk. Connective or fibrous tissue holds glandular and fatty breast tissue in place. Benign breast diseases affect women at various stages of their lives, from early reproductive years to the postmenopausal period. There is a growing prevalence detected through population-based mammographic screening. Benign breast diseases include epithelial proliferation with atypia or without atypia, fibroadenomas, papilloma, adenosis, calcifications, fluid-filled cysts, and fibrocystic changes. Several factors, including hor-

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monal factors, early onset of menstruation, abnormalities in menstrual cycles, nulliparity, old age at birth of first child, use of oral contraceptives pills, use of hormone replacement therapy and higher body mass index (BMI) after menopause have been linked to an increased risk of breast cancer. Conversely, longer duration of breastfeeding and higher BMI before menopause have been associated with a decreased risk.<sup>2</sup> Breast FNAC (Fine Needle Aspiration Cytology) is a minimally invasive diagnostic technique that is often used instead of an open biopsy. It is cost-effective, easy to perform, and provides quick results. While FNAC can distinguish between benign and malignant lesions, it cannot differentiate between invasive and non-invasive breast cancer. Open surgical biopsy/histopathology is still considered the standard for diagnosing detectable breast lesions. The gold standard for definitively assessing breast lumps is a triple assessment. However, FNAC has drawbacks such as pain and the risk of bleeding. It can also potentially mask radiological assessments when performed before mammography. Additionally, there may be cases where the aspirate does not contain enough cells for cytological examination, making it inadequate for diagnosis. In such cases, Tru-cut biopsies can be performed to address the issue. Tru-cut biopsies provide sufficient tissue for a conclusive histological diagnosis and can differentiate between invasive cancer and carcinoma in situ, especially when FNAC yields insufficient samples but suspicious ultrasound and/or mammography findings are present, including breast lesions with micro calcifications. The availability of tissue banking specimens from tru-cut biopsies is immensely helpful for research purposes. Tru-cut biopsy serves the main purpose of providing a clear pre-operative diagnosis of breast lesions and can be used as an alternative forensic method when FNAC fails to provide a diagnosis<sup>3</sup>. The objective of this study was to compare sensitivity and specificity of FNAC with tru-cut biopsy in diagnosis of breast lump patients.

### Material & Methods

It was a cross sectional study conducted at surgical department of Gulab Devi Teaching Hospital Lahore from January 2022 to December 2022. This study was conducted with approval of ethical review board. A total of 122 patients presented in surgical OPD with complaints of breast lump of size between 2cm to 4 cm were included in the study with their consent. All patients with breast lump less than 2 cm and more than 4cm were excluded from the study. Similarly patients with

recurrent disease were also excluded from the study. All these patients underwent FNAC, true cut biopsy of breast lump followed by excision of lump or mastectomy. Specimen taken after surgical procedure was also sent for histopathology to compare its results with FNAC and tru-cut biopsy reports. All the data was collected on prescribed proforma. Sensitivity and specificity of both FNAC and tru-cut was calculated through SPSS 24. All quantitative data is presented in the form of means and standard deviation while qualitative data is presented in the form of frequency tables. A P-value of less than 0.05 is taken as significant.

### Results

Mean age of patients included in this study was  $35.4 \pm 14.6$  years with range from 15 to 70 years. The mean age of patients having benign breast diseases was  $26.0 \pm 12.1$  years while patients having malignant breast disease had mean age of  $46.1 \pm 9.7$  years. Mean weight of patients included in this study was  $55.8 \pm 13.4$  kg. Out of these 122 patients only 04 (3.2%) were male while 118 (96.8%) were female. In these 122 patients 74 (60.7%) had lump in right breast while 48 (39.3%) had lump in left breast. Out of these 122 patients 59 (48.4%) were diagnosed with fibroadenoma, 57 (66.7%) with invasive ductal carcinoma, 6 (4.9%) with paget’s disease. Incidence of benign diseases was more in right breast as compared to left breast with 52.7% vs 47.3% respectively but incidence of malignant diseases was more on left breast as compared to right breast with 64.5% vs 35.5% respectively (p-value 0.06). The sensitivity and specificity of FNAC in benign breast diseases was 98.2% and 74.2% respectively while in malignant diseases it was 72.7% and 98.8% respectively (p-value 0.00). The sensitivity and specificity of tru-cut in breast diseases was 100%

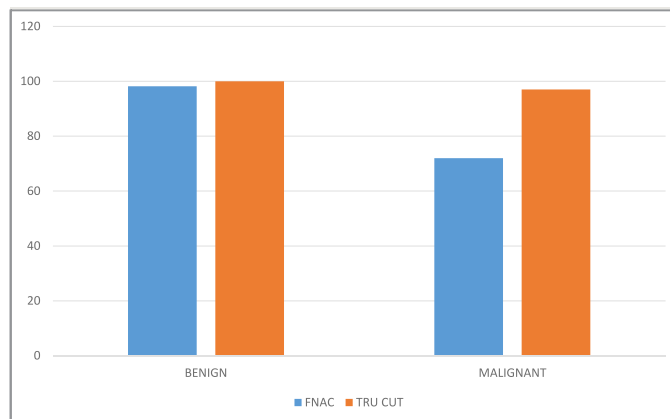


Fig-1: Comparison of sensitivity of fnac with trucut in benign and malignant breast diseases.

and 97.1% respectively while in malignant diseases it was 97% and 98.2% respectively (p-value 0.00). The mean procedure time for FNAC was  $3.9 \pm 0.95$  minutes while for TRU CUT it was  $16.7 \pm 2.97$  minutes. The complication rate in tru-cut was 4.1% as compared to FNAC 2.1% in our study. The most common complication in tru-cut was bleeding (60%) while in FNAC skin infection (100%) was the most common complication.

## Discussion

Breast lump is most common presentation in female as compared to male patients. In our study only 3.2% patients were male who presented with complaint of breast lump as compared to 96.8% female. This is according to national and international data.<sup>4</sup> According to Gucalp A et al men breast tumors are only 1% of all the reported breast cancer world wide.<sup>5</sup> In our study incidence of breast cancer in men was zero.

In our study prevalence of malignant breast diseases was more as compared to benign diseases. According to our study 48.4% patients presented with benign lump most commonly fibroadenoma as compared to 51.6% malignant diseases with most common invasive ductal carcinoma followed by paget's disease of breast. According to previous national data the incidence of breast cancer in patients breast lump was 24.06%.<sup>6</sup> In our study this incidence is twice of the documented data because of many reasons which includes illiteracy in population, no awareness about disease, social and religious constraints. In our part of world females do not have any knowledge about self-examination and do not report to hospital for breast lump until it is complicated. The incidence of breast cancer is common among old age group. In our study mean age of patients having malignant breast disease was  $46.1 \pm 9.7$  years as compared to  $26.0 \pm 12.1$  years in patients having benign breast diseases. Our results were accordance to national and international data according to which breast cancer is most common among old age women with maximum incidence between 50-64 years of age.<sup>7,8</sup>

The sensitivity and specificity of FNAC for benign breast diseases is more than that of malignant diseases. In our study sensitivity and specificity for benign diseases in FNAC is 98.2% and 74.2% as compared to 72.7% and 98.8% in malignant diseases respectively. The documented sensitivity of FNAC for benign breast diseases in national and international literature is 98.8% which is according to our data.<sup>9,10</sup> Similarly specificity for malignant

diseases is between 70-95% according to data.<sup>11,12</sup> In our study it was 72.7% which is within this range.

The sensitivity and specificity of tru-cut for benign breast diseases is more than that of malignant diseases. In our study sensitivity and specificity for benign diseases in tru-cut is 100% and 97.1% as compared to 97% and 98.2% in malignant diseases respectively. The documented sensitivity of tru-cut biopsy in benign and malignant diseases is between 87-99%.<sup>12,13</sup> The sensitivity of FNAC and tru-cut for benign diseases is almost equal (98.2% vs 100%) in our study while there was major difference in sensitivity between FNAC and tru-cut for malignant diseases (72.7% vs 97%). The procedural time for FNAC is short ( $3.9 \pm 0.95$  minutes) as compared to tru-cut ( $16.7 \pm 2.97$  minutes) as FNAC is less invasive procedure as compared to tru-cut biopsy. According to our study complication rate was more in tru-cut (4.1%) as compared to FNAC (2.1%). Most common complication encountered in FNAC was skin infection (100%) as compared to hemorrhage (60%) in tru-cut biopsy. These are the most common documented complications in literature.<sup>14</sup>

## Conclusion

Breast lump is more common in females as compared to males. Breast carcinoma is more common in old females and benign breast diseases is common among young females. Tru-cut biopsy is better than FNAC in diagnosis of both benign and malignant lesions of breast with minimum complication rate.

Conflict of Interest *None*

Funding Source *None*

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### Authors Contribution

**UAR, MAI:** Conceptualization of Project

**MJB, CMAN:** Data Collection

**IA, HY:** Literature Search

**UAR, MAI:** Statistical Analysis

**UAR, MAI:** Drafting, Revision

**UAR, MAI:** Writing of Manuscript