



Fine Needle Aspiration Versus Trucut Biopsy in The Diagnosis of Breast Cancer in Fiji

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Abstract

Background: Breast cancer is the most commonly diagnosed malignancy among women and a leading cause of cancer-related mortality. Early and accurate diagnosis of breast cancer is essential to improve outcomes, particularly in resource-limited settings.

Objective: To compare the diagnostic accuracy of Fine-Needle Aspiration (FNA) and Tru-cut biopsy with final histopathological diagnosis in detecting breast cancer.

Material and Methods: A retrospective cross-sectional study was conducted at Lautoka Hospital, Fiji, from 1 January to 31 December 2024. Data were analysed using frequencies and percentages.

Results: Seventy-two patients were included. Most patients were older than 60 years (28.7%), and 30.5% presented with symptoms for more than 24 months. Of the 72 breast lumps, 42 were malignant and 30 were benign on final histopathology. The sensitivity of FNA and Tru-cut biopsy was 94% and 100%, respectively.

Conclusion: Tru-cut biopsy demonstrated higher diagnostic accuracy and provided critical tumour characterization compared to FNA. However, in resource-limited settings such as Fiji, FNA remains a valuable, cost-effective diagnostic tool. Improved breast cancer surveillance is needed to address geographical barriers and poor health-seeking behaviour.

Keywords: Breast cancer; Histopathology; Fine-needle aspiration

Introduction

Breast cancer remains a significant global health concern, being the most commonly diagnosed cancer among women worldwide. As per World Health Organisation statistics in 2022, there were 2.3 million women diagnosed with breast cancer and 670 000 deaths globally [1]. Breast cancer can occur in women of any age after puberty but with increasing rates in later life. Breast cancer is a significant health concern in Fiji, and is the leading cause of cancer related death in Fiji; ranking Fiji second globally in breast cancer mortality [1-4].

Fine needle aspiration, due to its simple and cost-effective technique is often used as first priority investigation in patients with breast lump as part of the triple test in diagnosis of breast cancer. However, it has certain limitations and lacks important information about histopathological type, grade, receptor status of the tumour for correct preoperative evaluation [3-6]. Trucut biopsy has been introduced as it is less invasive, relatively easy and can be performed as outpatient basis compared to excisional biopsy in obtaining tissue for histopathological diagnosis [3-9].

Timely diagnosis of breast cancer is essential for effective management; thus, this study was conducted to compare the results of FNA cytology and Trucut biopsy with final histopathology in diagnosing breast cancer and designing appropriate management strategies best suited in our local setting.

Material and Method

Study Setting and Period

This study was conducted in Lautoka Hospital located in Lautoka City, in the Republic of Fiji Islands. The 305 bed Lautoka Hospital serves more than 330,000 people living in the Western Division. It also functions as a teaching hospital with affiliations to the Fiji National University and The University of Fiji. Data was collected from January 1st 2024 to December 31st 2024.

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Study Design and Population

This hospital-based retrospective, cross sectional study included seventy-two patients who presented to the surgical clinic at Lautoka Hospital with breast lump from January 1st, 2024, to December 31st, 2024.

Inclusion Criteria

All female patients above the age of 20 years of age with clinically palpable breast lumps were included in the study.

Exclusion Criteria

1. Patients below 20 years of age
2. Patients with breast lump who are not taken for surgery
3. Patients non-compliant for Fine Needle Aspiration or Tru-cut biopsy
4. Patients with recurrent malignancy undergoing neoadjuvant chemotherapy or patients with locally advanced malignant mass
5. Patients with acute or tender breast lump, like breast abscess
6. Male patients

Instruments and Techniques

The following equipment is used for Fine Needle Aspiration:

- 10mls disposable syringe
- 22-gauge disposable needle
- Spirit swabs
- Sterile gloves

Technique: Under aseptic technique, a 22-gauge needle connected to a 10ml syringe is introduced into the breast lump and the specimen is aspirated. Specimen is then sent for slide preparation for cytological examination.

The following equipment is used for Tru-cut Biopsy

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

Technique: Under aseptic technique, application of local anaesthesia with 2% lignocaine. The mass is localized and immobilized. Skin incision is made and needle is inserted into the mass with different angulation to obtain specimens. The specimen is then immersed into formalin and sent for histopathological examination.

Data Analysis and Presentation

Data was collected and entered into Microsoft Excel and analysed using SPSS version 25. Descriptive statistics were presented as both frequencies and percentages.

Ethical Considerations

Ethical clearance was obtained from Fiji Human Health Research and Ethics Review Committee (FNHRERC Number: 37/2024) and Lautoka Hospital HCF Research Unit. Since the data is retrospective, the requirement for patient informed consent to review medical records was waived by the committee. The confidentiality of the study population was ensured by excluding any personal identification.

Results

The study population consisted of 72 participants, with 28.75% of patients in the age group >60 years. Majority of the patients (52 (72%)) sought medical attention after 3 months of onset of symptoms (Table 1).

FNA cytology diagnosed breast cancer in 16 patients. One case of metaplastic ductal carcinoma was reported false negative. Seven cases, one of benign phyllodes, three of infiltrating ductal carcinoma and three of benign breast disease were reported as inconclusive. Five cases, one of infiltrating lobular carcinoma, one of benign phyllodes, one of infiltrating ductal carcinoma, one of fibroadenoma, and one of benign breast disease were reported as insufficient sample. The sensitivity and specificity of FNA cytology for breast malignancy was 94% and 100% respectively (Table 2). Tru-cut biopsy diagnosed breast cancer in 20 patients. Seventeen of infiltrating ductal carcinoma, one of mucinous carcinoma and two cases of infiltrating lobular carcinoma. The sensitivity and specificity of Tru-cut biopsy for breast malignancy was 100% respectively (Table 3).

Discussion

Breast lumps are one of the commonest presenting complaints encountered in surgical outpatient clinics which makes it imperative to differentiate between benign and malignant conditions. Early diagnosis of breast cancer is crucial in improving chances of survival and enhancing overall quality of life as treatment of advanced stages is ineffective [1-3].

This study showed a high incidence of breast lumps in the third to sixth decade of life. Majority of the patients presented twenty-four

Table 1: Age distribution and Duration of Symptom.

Variable	Frequency (N)
Age (Years)	
20 - 30	7 (9.75%)
31 - 40	17 (24%)
41 - 50	14 (19%)
51 - 60	13 (18.5%)
>60	21 (28.75%)
Duration of Symptoms (Months)	
<3	20 (28%)
3 - 6	12 (16.5%)
6 - 12	8 (11%)
12 - 24	10 (14%)
>24	22 (30.5%)

Table 2: FNA Cytology vs Final Histopathology.

Malignant - 16	Mucinous Carcinoma - 2 Infiltrating Ductal Carcinoma - 13 Infiltrating Papillary Carcinoma - 1
Benign - 8	Fibroadenoma - 5 Metaplastic Ductal Carcinoma - 1 Benign Breast Disease - 2
Inconclusive - 7	Phyllodes - 1 Infiltrating Ductal Carcinoma - 3 Benign Breast Disease - 3
Insufficient Sample - 5	Infiltrating Lobular Carcinoma - 1 Phyllodes - 1 Infiltrating Ductal Carcinoma - 1 Fibroadenoma - 1 Benign Breast Disease - 1

Table 3: Trucut Histopathology.

Mucinous Carcinoma	1
Infiltrating Lobular Carcinoma	2
Phyllodes	3
Infiltrating Ductal Carcinoma	17
Inflammatory Process	5
Benign Breast Disease	6
Ductal Hyperplasia	2

months after discovering the breast lump, highlighting poor health seeking behaviour among Fijian women. Carol K Naidu et al, in their studies highlighted lack of awareness and misconception, low health literacy, cultural and religious beliefs, financial constraints, geographical isolation, limited health care access and fear of health care system, as some of the barriers to health seeking behaviour [2]. These findings emphasize the need for public health strategies to enhance breast cancer awareness and screening.

Fine needle aspiration offers a pragmatic, efficient, and effective first-line diagnostic tool for breast lesions. It bridges gaps posed by limited infrastructure, long referral pathways, and financial constraints particularly in developing countries [5,6]. FNA is cost effective, minimally invasive and gives rapid diagnostic results however lacks important information about histopathological type, grade, receptor status of the tumour for correct preoperative evaluation. In this study the sensitivity and specificity of FNA cytology for breast malignancy was 94% and 100% respectively with negative predictive value 87.5%.

Tru-cut biopsy stands out as an efficient diagnostic tool in breast cancer evaluation. Its strengths ranging from high diagnostic accuracy, preservation of tissue architecture, biomarker evaluation, to cost-efficiency and patient comfort make it especially valuable for both well-resourced and resource-constrained clinical settings [7-9]. In this study the sensitivity and specificity of tru-cut biopsy for breast malignancy was 100% respectively, consistent with other studies [10,11].

Conclusion

Fine-Needle Aspiration (FNA) and Tru-cut biopsy are complementary techniques in the diagnosis of breast malignancy. In this study, Tru-cut biopsy proved superior to FNA in accurately detecting malignant lesions, as it provides additional information

on tumour type, histological grade, lymph vascular invasion, and hormone receptor status, all of which are essential for treatment planning. However, in a resource-limited setting such as Fiji, FNA remains an important diagnostic tool due to its cost-effectiveness and rapid turnaround time. Given the country's geographical isolation and suboptimal health-seeking behaviour among patients, the development of a more robust breast cancer surveillance and follow-up system is warranted.

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