

Fine-needle Aspiration Cytology with Post-operative Histopathology Correlation of Lump Breast

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Abstract

Introduction: Diseases of the breast constitute a significant proportion of surgical cases seen in both developed and developing countries, and frequently, the need arises to distinguish benign from malignant lesions before definitive treatment. Fine-needle aspiration cytology (FNAC) of lump breast is an important test to differentiate between benign and malignant lesion which cannot be dealt clinically. It is extremely beneficial in reaffirming the clinical impression of benign disease, which may not need a subsequent biopsy.

Aim: To assess the diagnostic accuracy of FNAC in differentiating the benign and malignant lesions of palpable breast lump with post-operative histopathological correlation.

Materials and Methods: 75 women presenting with complaints of lump breast were included in the study. FNAC followed by appropriate surgical management and histopathological examination of excised specimen.

Results: The diagnostic accuracy of FNAC in patients with malignant breast lesions was 93.55%, for benign breast lesion was 100%. Sensitivity in diagnosing malignancy is 100%, and specificity is 93.55%. Positive predictive value is 95.65%, negative predictive value is 100% which implies FNAC as a screening test.

Conclusion: FNAC is an important and essential preliminary test in diagnosing a patient presenting with a breast lump and proceed with appropriate surgical management, and it shows a high degree of correlation with the final histopathological report.

Key words: Fine-needle aspiration cytology, Histopathological examination correlation, Lump breast

INTRODUCTION

Diseases of the breast constitute a significant proportion of surgical cases seen in both developed and developing countries, and frequently, the need arises to distinguish benign from malignant lesions before definitive treatment. The development in patient education and screening programs has permitted a marked increase in the number of tumors detected.¹ The most common sign and symptom of

breast disease are a palpable mass although breast diseases can also present as an inflammatory lesion, nipple secretion, or imaging abnormalities.² Most of the patients presenting with lump breast are benign lesions.³ This produces anxiety in the patients and family members until they are reassured after thorough clinical examination and investigation.^{4,5} It is difficult to differentiate between benign and malignant breast lesions clinically. Therefore, a test as an outpatient basis is required to reach the definitive diagnosis before proceeding with the treatment. This should be an accurate, reproducible, and easy to perform test. This test must be accepted by the patient, can be done in busy outpatient setup without many expenses. Fine-needle aspiration cytology (FNAC) of lump breast is an important test to differentiate between benign and malignant lesion which cannot be dealt clinically. It reduces the number of open biopsies in a patient presenting with breast lump.⁶ FNAC is now

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used more frequently to diagnose any mass in the breast, which is clinically malignant. It is extremely beneficial in reaffirming the clinical impression of benign disease, which may not need subsequent biopsy. Furthermore, it allows more rapid diagnosis of a malignant condition in clinically non-suspicious masses. The ultimate benefit of aspiration cytology; however, rests in its demonstration of malignant disease, when other diagnostic modalities are inconclusive.⁷ FNAC of lump breast is a substitute to excision biopsy in majority of instances and can differentiate and delineate the nature of the disease in most of the instances.⁸

Aim

To assess the diagnostic accuracy of FNAC in differentiating the benign and malignant lesions of palpable breast lump with post-operative histopathological correlation.

MATERIALS AND METHODS

This prospective study was conducted in the Department of Surgery at Tirunelveli Medical College and Hospital, Tirunelveli, Tamil Nadu, India. Patients presenting with palpable lump breast were examined.

Inclusion Criteria

Patients aged between 15 and 70 years, presenting with complaints of lump in the breast were included in the study.

Exclusion Criteria

Patients presenting with acute surgical conditions such as mastitis and abscess, presenting with ulcerated breast lump, presenting with recurrent lump in the breast previously operated for malignancy, not willing for surgery, mass with skin infiltration. A detailed history was obtained, and a complete clinical examination was performed. The patient was informed about the risk and benefits of the procedure and the definitive treatment following the cytological diagnosis. FNAC followed by appropriate surgical management, and histopathological examination (HPE) of excised specimen was performed.

RESULTS

In the current study, out of 75 cases, the age incidence for the benign lesion ranged between 15 and 54 years, and the age incidence for malignant lesion ranged between 35 and 70 years. Benign lesion was commonly found between 15 and 24 years and for malignant lesion was commonly seen 45-54 years (Table 1).

In this study, the right breast was involved by the lump in 39 patients and 32 patients presented with lump in the left breast. Both breasts were involved in 4 of the patients, and all were benign lesions (Table 2).

The upper outer quadrant (UOQ) of breast was the most common quadrant to be involved by the lump followed by upper inner quadrant and central (Table 3).

In our study, 29 patients with lump in breast had fibroadenoma which was the most common cause of lump breast followed by 20 patients with ductal carcinoma and 6 with fibrocystic disease (Tables 4 and 5).

In FNAC, 29 patients were found to be malignant, whereas 31 found to be malignant in HPE correlation. FNAC had a diagnostic accuracy of 100% for a patient with benign breast lesions and 93.55% for malignant breast lesions. The sensitivity of FNAC in diagnosing patients presenting with lump in the breast was 100%. The specificity was 93.55%. The positive predictive value (PPV) of 95.65%. The negative predictive value (NPV) for FNAC was 100%. K - coefficient - 1.001068 which implies FNAC as a screening test its results are comparable with the gold standard HPE (Table 6).

DISCUSSION

In our study, the most common age group presenting with the breast lump was 35-44 years; benign breast lesion

Table 1: Age distribution in benign and malignant lump

Age (years)	Benign	Malignant
15-24	16	0
25-34	13	0
35-44	11	10
45-54	4	11
55-64	0	6
≥65	0	4
Total	44	31

Table 2: Distribution of patients according to affected side of breast

Side	Benign	Malignant	Total
Right	21	18	39
Left	19	13	32
Both	4	0	4
Total	44	31	75

Table 3: Distribution of patients according to the quadrant of breast

Quadrant	Benign	Malignant	Total
UOQ	21	21	42
UIQ	10	3	13
Central	4	6	10
LOQ	5	1	6
LIQ	4	0	4
Total	44	31	75

UOQ: Upper outer quadrant, UIQ: Upper inner quadrant, LOQ: Lower outer quadrant, LIQ: Lower inner quadrant

Table 4: Histopathological reports of benign breast lesions

Histopathological report	Number of patients
Fibroadenoma	29
Fibrocystic disease	6
Fibroadenosis	4
Phyllodes	3
Lipoma	1
Papilloma	1

Table 5: Histopathological reports of malignant breast lesions

Intraductal carcinoma	20
Intralobular carcinoma	1
Ductal carcinoma <i>in situ</i>	3
Mixed variant	1
Intrapapillary carcinoma	3
Mucinous carcinoma	1
Malignant phyllodes	2

Table 6: Predictive value of the fine-needle cytology of palpable breast lump

FNAC	HPE	
	Benign	Malignant
Benign	44	2
Malignant	0	29

FNAC: Fine-needle aspiration cytology, HPE: Histopathological examination

Table 7: Results compared with other studies

Study	Sensitivity	Specificity	PPV	NPV
Hussain ¹⁵	90.9	100	-	-
Alema <i>et al.</i> ¹⁶	85.29	100	100	98.79
Nguansangiam <i>et al.</i> ¹⁷	92.5	90.2	88.1	93.9
Ahmed <i>et al.</i> ¹⁸	92.6	95.2	95.5	92.2
Aziz <i>et al.</i> ¹⁹	85.29	100	100	98.79
Yeoh and Chan ²⁰	79	98	92	94
Choi <i>et al.</i> ²¹	77.7	99.2	98.4	88
Hebbar ²²	93.10	100	100	90.47
Our study	100	93.55	95.65	100

PPV: Positive predictive value, NPV: Negative predictive value

occurred between 15 and 54 years of age, malignant breast lesion occurred between 35 and 70 years of age, benign breast lesion was common in the age group of 15-24 years. The most common age group for malignant lesion was 45-54 years. Alam *et al.*⁹ studied that age-related incidence of carcinoma of the breast in female and resulted that benign lesions below the age 40 years and peak incidence in 2nd and 3rd decade of life, respectively, and malignant lesions above the age of 40 years and peak incidence in between 41 and 50 years. In Hebbar and Iyanna¹⁰ study, the age incidence was ranged from 16 to 74 years (mean age 41.68 years). The age incidence of the benign lesions ranged from 16 to 39 years (means age 27.89 years). The incidence of the malignant lesions ranged from 34 to 74 years (mean

age 52.25 years). The most common age group for benign lesions was between 21 and 30 years and for the malignant lesion was 41 to 50 years.

In our study, the right breast was commonly involved, and the UOQ was commonly involved which was comparable to study by Venugopal *et al.* in which both benign and malignant lesions are common in the UOQ. In our study, fibroadenoma was the common histopathological diagnosis of benign lesions. Moreover, intraductal carcinoma was the common histopathological diagnosis of malignant lesions.¹¹

Between 1982 and 2000 comparative study of FNAC with histopathological correlation was performed in 1158 women for a clinically palpable breast lump by Ariga *et al.*, concluded that sensitivity, specificity, and PPV were remarkably high with FNAC.¹² Another study was conducted by Rubinet *et al.*, which concluded that FNAC for lump had 100% PPV, 100% specificity, 87% sensitivity, and 89% NPV.¹³

A comparative study of FNAC and open biopsy in patients presenting with lump breast conducted by Aziz *et al.*¹⁴ In malignant disease, the sensitivity of FNAC was 85.29% with 100% specificity, 100% PPV, and 98.79% NPV. Although FNAC is slightly less sensitive (80%) in benign diseases, it is highly specific (100%), so it can help reassure and relieve the anxiety of the patients (Table 7).

CONCLUSION

The FNAC is an essential and important test in diagnosing and managing a patient presenting with lump breast. It is patient-friendly, easy to perform, more reliable, repeatable, and a simple test to diagnose patient presenting with lump breast. High sensitivity and high PPV shows that a patient with positive FNAC means a definite and accurate diagnosis of the concerned pathology when compared with the final histopathology report.

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