Fine Needle Aspiration Cytology and Histopathology Correlation of Breast Lesions in the District of Kanchipuram

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Abstract

Background: Breast carcinoma is the leading cause of death due to cancer in women. It is difficult to determine whether a lump is benign or malignant from clinical assessment. Fine needle aspiration cytology (FNAC) is a convenient and rapid procedure. Hence the present study was carried out to correlate fine needle aspiration cytology and histopathology of breast lesions. *Aims and Objectives:* To Correlate between FNAC and histopathology of breast lesions. *Material and Methods:* The present study is a retrospective study on 92 patients in Department of Pathology, Meenakshi Medical College and Research Institute, Kanchipuram from the period of March, 2014 to March2017. Patients were referred from department of surgery who has presented with breast lesions and pain in the breast. Hematoxylin and eosin slides of the breast cases were taken and FNAC slides were collected for the same patients and then correlation was done. *Results:* Statistical analysis showed sensitivity, specificity, positive predictive value, and negative predictive value of FNAC to be 93.3%, 100%, 100%, and 98.7%, respectively. *Conclusion:* FNAC is an effective modality for the diagnosis of breast lesions. It is a safe, simple, and cost effective outpatient procedure associated with negligible complications. In the present study it has a high sensitivity and specificity. It helps the clinicians for early diagnosis and specific management thus reducing morbidity and mortality.

Keywords: Fine Needle Aspiration Cytology; Histopathology; Sensitivity; Specificity; Positive Predictive Value and Negative Predictive Value.

Introduction

A palpable breast lump is a common clinical problem that presents to surgeons, gynecologists and general practitioners. The investigation of palpable breast lumps in successful breast programs utilizes a multidisciplinary approach that centres around the triple test, analyzing clinical and radiological findings in conjunction with the pathologic features to diagnose the lesion and determine the best treatment plan for the patient. Current practices utilize radiological imaging in combination with needle biopsy, reducing the need for unnecessary surgical excision of benign breast lesions[1].

Breast carcinoma is one of the leading causes of the malignancy in females. The diagnosis is made by fine needle aspiration.

The fine needle aspiration for the diagnosis of palpable breast masses was first introduced by Martin and Ellis in 1930. Dawson et al (1998) reported excellent results in breast cancer diagnosis in women age 35 or younger.

This study was undertaken to diagnose any breast lesions by cytology and to study the accuracy of fine needle aspiration cytology (FNAC) in diagnosing various breast lumps and to confirm cytological diagnosis by doing histopathologic study and obtain cytopathological correlation [2].

Aims and Objectives

To Correlate between FNAC and histopathology of breast lesions.

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Material and Methods

The present study is a retrospective study on 92 patients in Department of Pathology, Meenakshi Medical College and Research Institute, Kanchipuram from the period of March, 2014 to March 2017. Patients were referred from department of surgery who has presented with palpable breast lump and pain in the breast.

Hematoxylin and eosin slides of the breast cases were taken and FNAC slides were collected for the same patients and then correlation was done.

Inclusion Criteria

All female patients with breast lesions are referred from the department of surgery.

Exclusion Criteria

Breast masses in males.

Results

A total of 92 patients with breast lesions were taken. Age of the patients ranged from 11 to 70 years old, with mean age of 39.08 (Table 1 and Figure 13) , out of which 50 presented with clinical complaints of swelling, 31 presented with clinical complaints of pain, 3 presented with clinical complaints of discharge and 8 presented with clinical complaints of axillary lymphadenopathy (Table 2 and Figure 14). In quadrant distribution it includes all four quadrants, lower inner quadrant, lower outer quadrant, sub areolar, upper inner quadrant and upper outer quadrant (Table 3 and Figrure 15). FNAC results revealed 4 cases as inflammatory lesions, 58 cases as fibroadenoma, 2 cases as phyllodes tumor, 11 cases as fibrocystic breast disease, 4 cases as atypical ductal hyperplasia, 1 as suspicious of malignancy, 12 cases as malignancy. Comparison of FNAC and histopathologic findings were done out of 92 cases 77 turned to be benign lesion of breast that includes inflammatory lesion, fibroadenoma, phyllodes tumor, fibrocystic disease and 14 turned to be malignant lesion of breast which includes atypical ductal hyperplasia, intra ductal carcinoma and 1 which was diagnosed as border line phyllodes tumor in FNAC turned to metaplastic carcinoma of breast in histopathology (Table 4 and Figure 16).

Inflammatory lesion of the breast (breast abscess) in FNAC showed features of sheets of neutrophils(Figure 1) and in histopathology showed features of collections of inflammatory cells around the ducts (Figure 2).
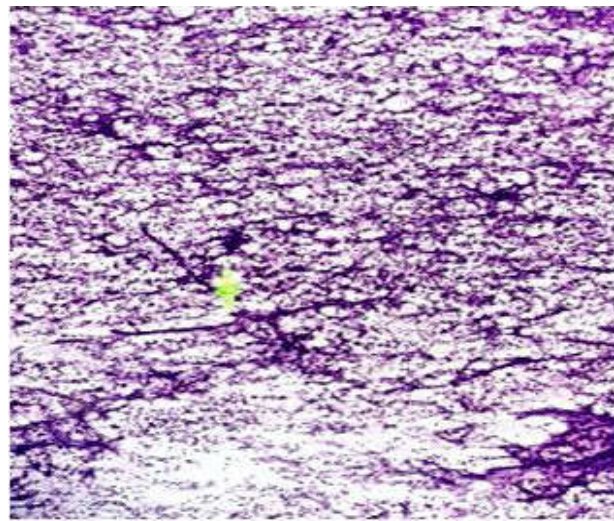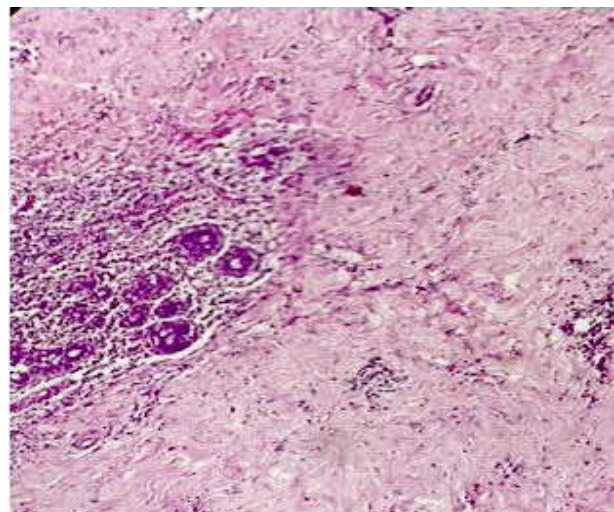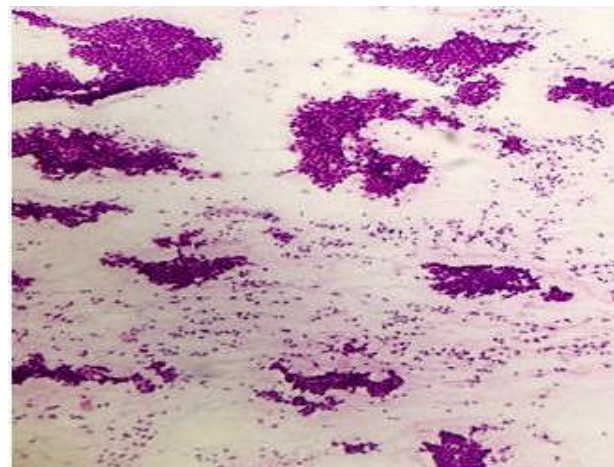

Fig. 1:

Fig. 2:

Fig. 3:

Fibroadenoma in FNAC showed features of bimodal population of cells which are arranged in monolayered sheets in a background of bare nuclei (Figure 3) and in histopathology showed features of both pericanalicular and intracanalicular pattern of fibroadenoma (Figure 4).

Benign phyllodes tumor in FNAC smears are cellular with dispersed cells with bare oval or plump spindle nuclei (Figure 5) and in histopathology shows increased stromal cellularity and overgrowth gives rise to the typical leaf like architecture (Figure 6).
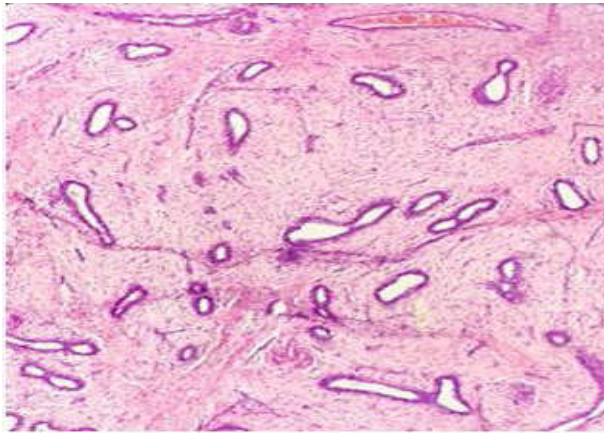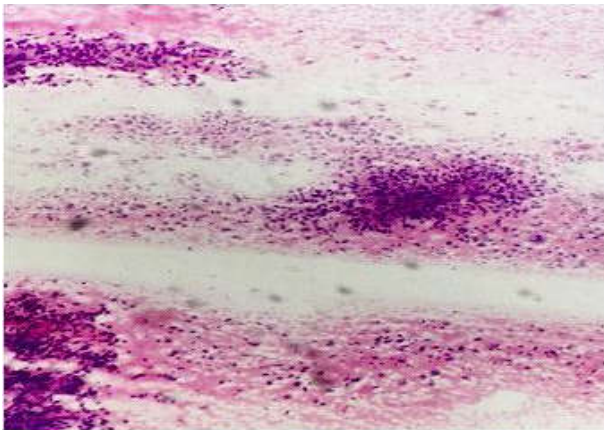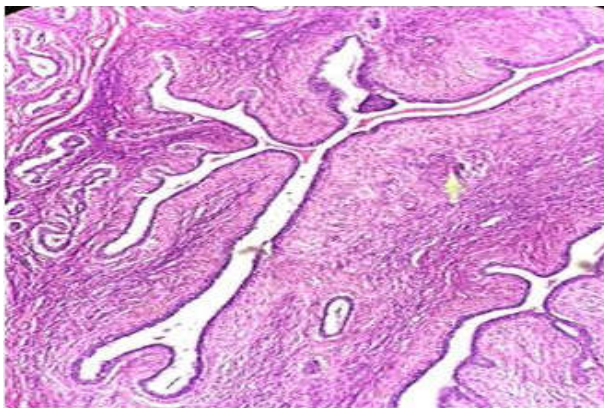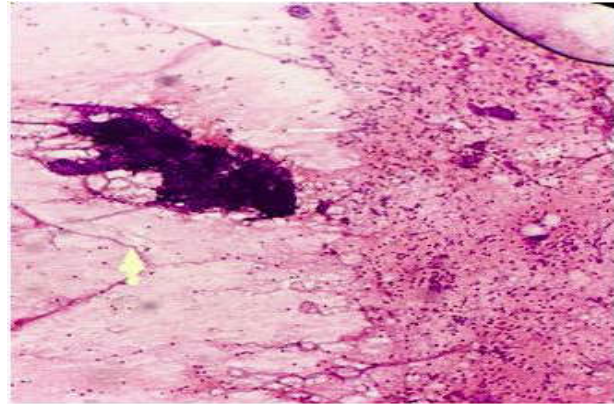

Fig. 7:

Fibrocystic disease of the breast in FNAC shows ductal epithelial cells, oncocytic cells and cystic macrophages (Figure 7) and in histopathology shows cystically diated ducts with apocrine metaplasia (Figure 8).
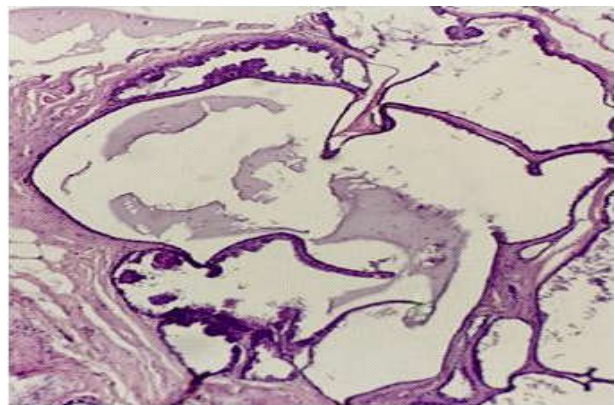

Fig. 4:

Fig. 8:

Suggestive of malignancy in FNAC shows discohesive clusters of ductal epithelial cells which are arranged in clusters and singles shows abundant cytoplasm, nuclear pleomorphism, hyperchromatism and prominent nucleoli in a background of individual cells and hemorrhage (Figure 9) and in histopathology shows malignant neoplasm shows tumor cells cells are arranged in sheets showing pleomorphism and hyperchromatism (Figure 10) .
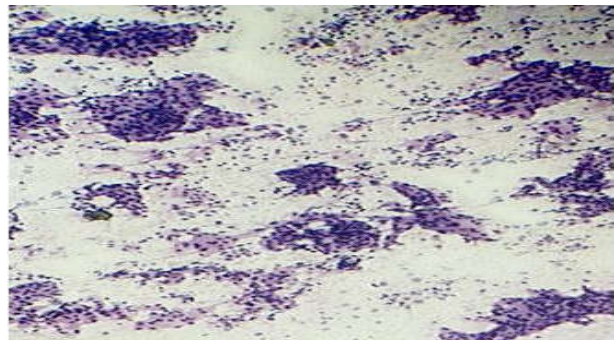

Fig. 5:

Fig. 6:

Fig. 9:

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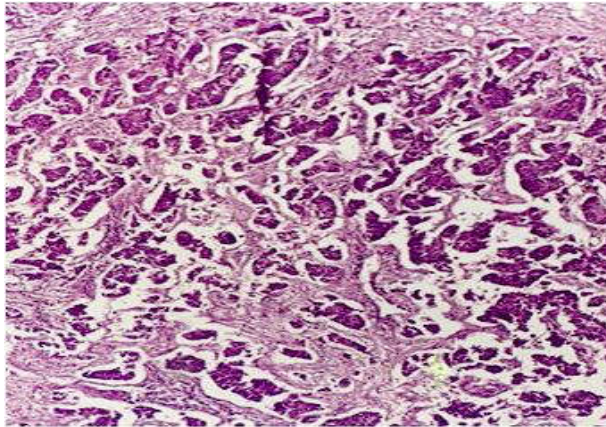
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Fig. 10:

The one which is diagnosed as border line phyllodes tumor in FNAC shows smears are cellular showing bimodal population of cells composed predominantly of spindle cells and few round cells in papillary pattern and also dispersed in singles. The cells have abundant eosinophilic cytoplasm, vesicular nucleus with irregular coarse chromatin and prominent nucleoli. Binucleated cells and mitotic figures are also seen in a background of haemorrhage (Figure 11) and in histopathology it is diagnosed as metaplastic carcinoma of breast shows anaplastic spindle cells with high mitotic rate with few giant cells and infiltrating ductal carcinoma with focal metapastic cartilage, focal squamous metaplasia and dense sclerosis (Figure12).
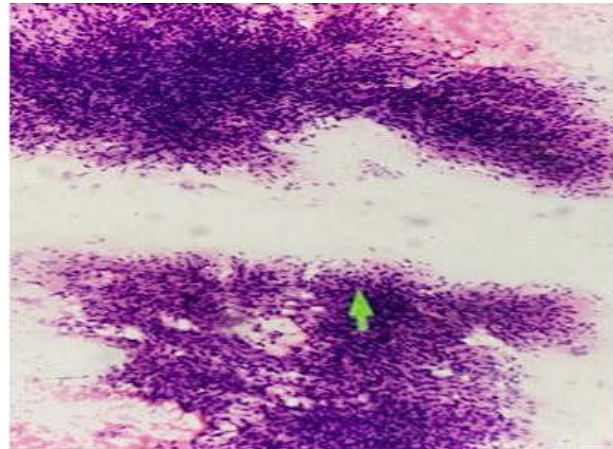

Fig. 11:

Table 1: Distribution of the patients according to the age group Total number of patients = 92

Age group of the patient	Number of patients
11– 20 years	12
21 – 30 years	32
31– 40 years	30
41– 50 years	6
51– 60 years	6
61- 70 years	6
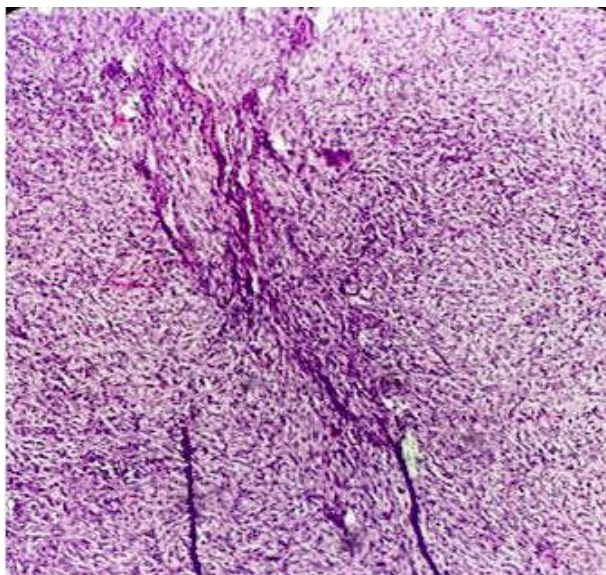
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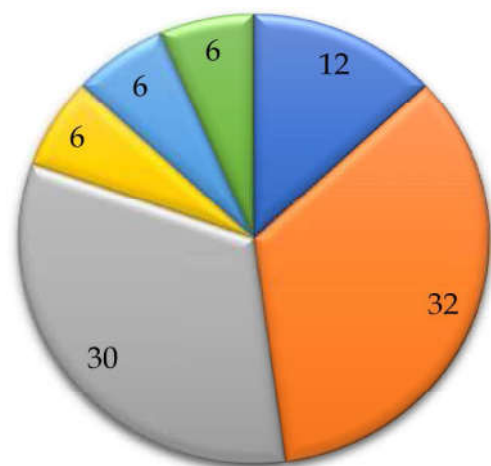
Fig. 13:

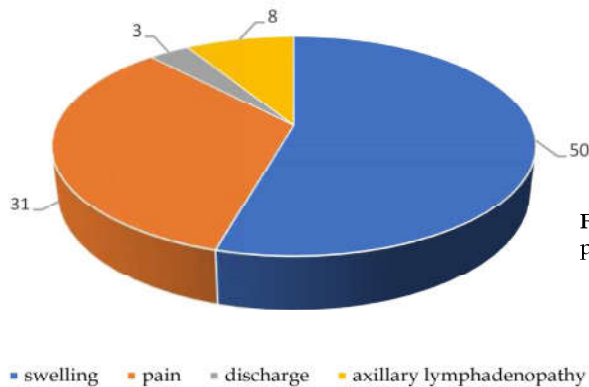**Table 2:** Distribution of the patients according to the presenting complaints Total number of patients = 92

Presenting Complaints	Number of Patients
Swelling	50
Pain	31
Discharge	3
Axillary lymphadenopathy	8

Table 3: Distribution of patients according to quadrant distribution

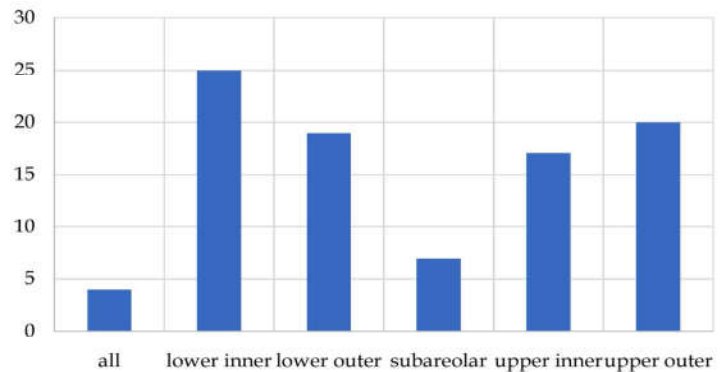| Quadrants Distribution	Number of Patients
All quadrants	4
Lower inner quadrant	25
Lower outer quadrant	19
Sub areolar quadrant	7
Upper inner quadrant	17
Upper outer quadrant	20

Table 4: Breast lesions diagnosed in FNAC and their histopathologic comparison. Total number of patients = 92

Fine needle aspiration cytology	Histopathological diagnosis	Total number of cases
Inflammatory lesion (breast abscess)	Breast abscess	4
Fibroadenoma	Fibroadenoma	58
Benign Phyllodes tumor	Benign phyllodes tumor	2
Border line phyllodes tumor	Metaplastic carcinoma	1
Fibrocystic disease	Fibrocystic disease	11
Atypical ductal hyperplasia	Atypical ductal hyperplasia	4
Suspicious of malignancy	Intra ductal carcinoma	1
Malignancy	Intra ductal carcinoma	11

Fig. 14: Distribution of the patients according to the presenting complaints

■ swelling ■ pain ■ discharge ■ axillary lymphadenopathy

Fig. 15: Distribution of patients according to quadrant distribution

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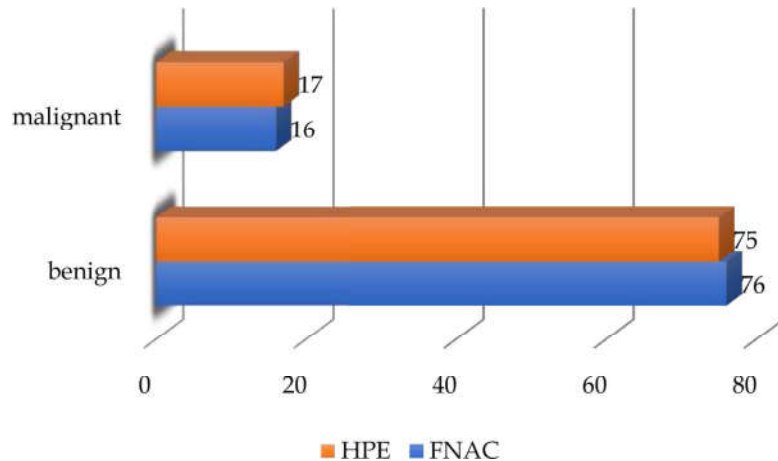Lesions in the District of Kanchipuram

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Fig. 16: Breast lesions diagnosed in FNAC and their histopathologic comparison.

Discussion

In this study a total of 92 cases were taken most of the patients are in age group of in and around 30years. Maximum number of patients presented with the complaints of swelling.

In maximum number of patients the swelling involved is lower inner quadrant.

In FNAC 75 cases which was diagnosed as benign breast disease diagnosed as benign breast disease in histopathology and 16 cases which was diagnosed as malignant in FNAC turned to be malignant lesion in histopathology. The one which is diagnosed as benign in FNAC border line phyllodes tumor was diagnosed malignant in histopathology metaplastic carcinoma of breast thus giving one false negative result.

Statistical analysis in this study shows sensitivity, specificity, positive predictive value, and negative predictive value of FNAC to be 93.3%, 100%, 100% and 98.7%.

Compared with other study statistical data muddeowda PH et al (2011) study shows sensitivity of 94.5%, specificity of 98%, positive predictive value of 95.8%, negative predictive value of 97.4% [3].

Bukhari MH et al (2011) study shows sensitivity of 98%, specificity of 100%, positive predictive value of 97%, negative predictive value of 100% [4].

Alema ON et al (2012) study shows sensitivity of 83.3%, specificity of 100%, positive predictive value of 100%, negative predictive value of 98.6% [5].

Mahajan NA et al (2013) study shows sensitivity of 96.66%, specificity 98.66%, positive predictive value of 96.77%, negative predictive value of 98.66% [6].

Dominguez F et al (1997) study shows sensitivity of 93.49%, specificity of 95.73%, positive predictive value of 93.49%, negative predictive value 95.73% [7].

Ariga R et al (2002) study shows sensitivity of 98%, specificity of 98%, positive predictive value of 99%, negative predictive value of 91% [8].

Paramesh et al (2015) study shows sensitivity of 95.45%, specificity of 100%, positive predictive value of 100%, negative predictive value of 97.06% [2].

Conclusion

In breast lesions fine needle aspiration cytology (FNAC) is a technique utilized owing to its distinct advantages of being sensitive and specific, expedient, economical and safe. It bridges a gap between clinical evaluation and final surgical pathological diagnosis in majority of cases. It will give the clinician diagnosis in high percentage of cases with minimal expenditure of time and money and often to avoid unnecessary surgery.

In the present study suggests that FNAC gives positive correlation with histopathology with high sensitivity and specificity. Hence FNAC is used as an effective screening tool and first line diagnostic test for evaluation of breast lesions. It helps the clinicians for early diagnosis and specific management thus reducing morbidity and mortality [2].

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