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Original Research Article

Correlation between Histopathology and Cytological Evaluation of Benign Breast Lesions

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Abstract

Background: FNAC has become widely accepted tool for diagnosis of breast lesions as it is safe and simple method with high diagnostic accuracy. Aim of this study to evaluate the diagnostic efficacy of FNAC, histological analysis was performed on women who had benign breast lesions diagnosed by FNAC.

Methods: From February 2025 to July 2025, 60 patients with benign breast lesions participated in this prospective study at the Department of Pathology, JLNMCH, Bhagalpur, and Bihar. All patients who had mastectomy, excision biopsy/lumpectomies, or FNAC with an unspecified initial diagnosis of breast lump were included in the study.

Results: With a diagnosis accuracy of 96.7% for benign breast lesions, FNAC revealed 60 benign cases, of which 58 were benign and 1 case each of fibrocystic disease and mastitis had infiltrating ductal cancer.

Conclusion: FNAC is a safe, simple, and cost-effective outpatient procedure associated with negligible complication. And along with histopathological correlation it increases the diagnostic accuracy. That helps the clinicians for early diagnosis and specific management thus reducing morbidity and mortality.

Keywords: Benign Breast Disease, Fibroadenoma, Fibrocystic Changes, Proliferative Breast Disease.

Introduction

A wide collection of lesions with a range of symptoms or that may be detected as incidental microscopic results are referred to as "benign breast diseases." In younger people, it is rather prevalent. The frequency increases in the second decade of life and peaks in the fourth and fifth decades. On the other hand, malignant illnesses are more prevalent following menopause.[1-6]

Benign processes may be completely asymptomatic or have a variety of clinical manifestations, such as palpable nodularity, thickening, mass, pain, inflammation, or nipple discharge. Many of the signs and symptoms encountered in various breast diseases are nonspecific and require further evaluation by means of imaging and sometimes followed by biopsy study for definitive diagnosis. The benign lesions can arise from different kind of cells and can be inflammatory or proliferative. They include skin lesions, vascular lesions, lymph nodes, fat necrosis, foreign bodies, infections, fibroadenomas, other benign tumors, cysts, galactoceles, adenosis, fibrosis, duct ectasias, papillomas, radial scar, and spectrum of epithelial hyperplasias with or without atypia.[7]Benign epithelial lesions are classified broadly into three groups, according to the subsequent risk of developing breast cancer.[8] Non-proliferative breast changes, which include, fibrocystic changes are not associated with an increased risk of breast cancer. [7] Proliferative breast disease characterized by proliferation of epithelial cells, without atypia, are associated with a small increase in the risk of subsequent carcinoma in either breast. They are predictors of risk but are thought to be unlikely precursors of carcinoma.[9]

Material and Methods

This study was done in Department of Pathology, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar from February 2025 to July 2025. 60 female patients whose aged between 10-60 years attending outpatient department of JLNMCH, Bhagalpur, Bihar. The study included all individuals who underwent FNAC, excision biopsy/lumpectomies, or mastectomy with an unidentified primary diagnosis of a breast lump.

The study eliminated patients who did not receive a second histological evaluation. The patient was fully briefed about the surgery before providing signed consent. The treatment was carried out by a

certified cytolopathologist without the use of any anesthesia. Spirit was used to clean, stabilize, and hold the skin above the lump. Many passes through the lump were done with the plunger retracted until there was enough material visible in the needle hub. The syringe was used to aspirate air, then after reattaching the needle, the aspirated substance was injected onto slides. For each patient, six to eight slides were created. Hematoxylin and Eosin (H&E) was used to stain one of the smears after it had been wet fixed in 95% methanol. The Giemsa stain was applied to the air-dried streaks. Histopathological correlations were made for all of the patients.

Results

All the Sixty patients underwent a diagnostic FNAC in our pathology department following which all underwent an exicisional surgical procedure after admission to hospital. Excised specimens obtained were subjected to histopathology. The FNAC report was correlated with the final histopathology report and statistical tests were used to interpret the results.

Out of sixty benign cases diagnosed on FNAC, fifty eight cases were benign suggesting 96.7% diagnostic accuracy of FNAC in diagnosing benign breast lesions. The age groups were divided as 10-19, 20-29, 30-39, 40-49 and above 50 years. Of these groups, 20-29 group was largest.

Thirty eight were between 20-29 years, twelve between 30-39, four between 10-19 years, six between 40-49 and above 50 years. Only two cases diagnosed as fibrocystic disease had family history of breast disease. Right sided lesion was seen in twenty eight and left sided lesion in thirty two cases. FNAC was done in sixty cases with breast disease, thirty nine of them had fibroadenoma, two had mastitis, benign breast disease in seven cases, ten had fibrocystic disease, one case of phyllodes and only one had fibroadenosis.

Table 1: Cytological Diagnoses of Breast diseases included in the study

Cytological Diagnosis	No. of Cases	Percentage
Fibrocystic disease	10	16.66%
Fibroadenoma	39	65.0%
Benign Proliferative Disease	7	11.66%
Fibroadenosis	1	1.66%
Mastitis	2	3.33%
Phyllodes tumor	1	1.66%

Out of sixty cases with benign breast disease observed in cytology, fifty eight cases showed benign breast disease on histopathological evaluation with diagnostic accuracy of 96.7% for benign breast disease on FNAC.

Out of Thirty nine cases of fibroadenoma diagnosed on FNAC, thirty seven was fibroadenoma and two cases had features of both fibroadenoma and fibrocystic disease with diagnostic accuracy of 100%. Out of 10 cases of fibrocystic disease diagnosed on FNAC, eight was fibrocystic disease, one had features of both fibrocystic disease and fibroadenoma and one case had infiltrating ductal carcinoma of breast on histology with diagnostic accuracy of 90%. Seven cases of benign proliferative breast disease had similar features on histology with diagnostic accuracy of 100%.

One case each of fibroadenosis and phyllodes tumor on FNA had similar features on histology with diagnostic accuracy of 100%. Out of two cases of mastitis, one was mastitis and other one was infiltrating ductal carcinoma of breast on histology with diagnostic accuracy of only 50%. Of all the benign breast lesions diagnosed on FNAC, only two had malignancy.

Table 2: Histopathological correlation of cases diagnosed as benign on cytology

BreastLesion	Cytology	HPE
Fibroadenoma	39	37
Fibrocystic disease	10	8
Fibroadenoma and fibrocystic disease	0	3
Benign Proliferative Breast Disease	7	7
Mastitis	2	1
Fibroadenosis	1	1
Phyllodestumor	1	1
Infiltrating Ductal carcinoma	0	2

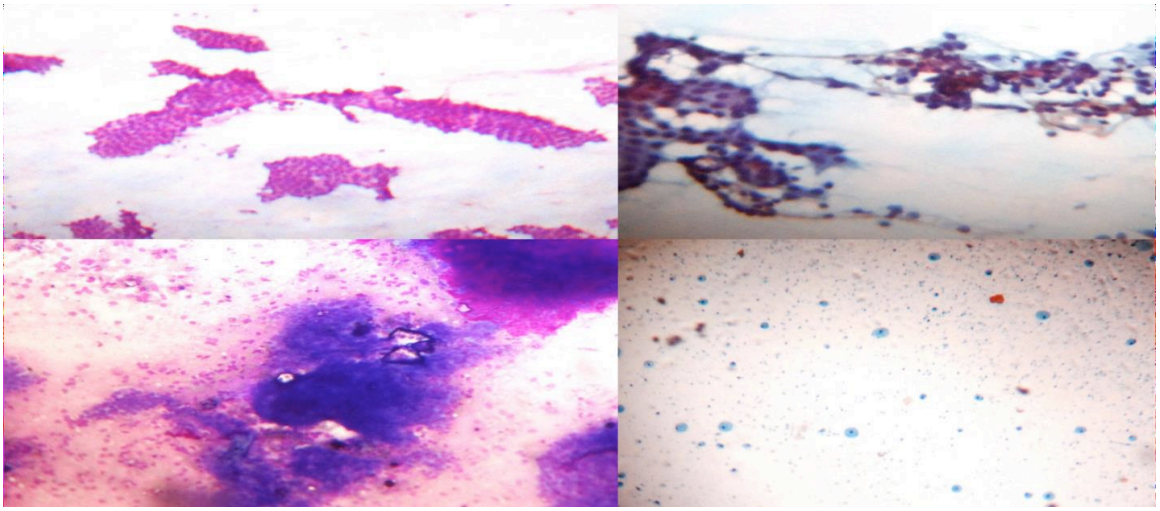

Figure 1: Upper right (H&E, 4x magnification) showing branching monolayered sheets of ductal epithelial cells in the background of bare nuclei in fibroadenoma. Upper left (pap, 4x magnification) showing ductal epithelial cells with apocrine cell change along with cyst macrophages in fibrocystic disease. Lower right(leishman, 4x magnification) showing sheets of degenerated neutrophils in Mastitis. Lower left(pap, 4x magnification) showing cyst macrophage and squamous epithelial cells in Duct ectasia

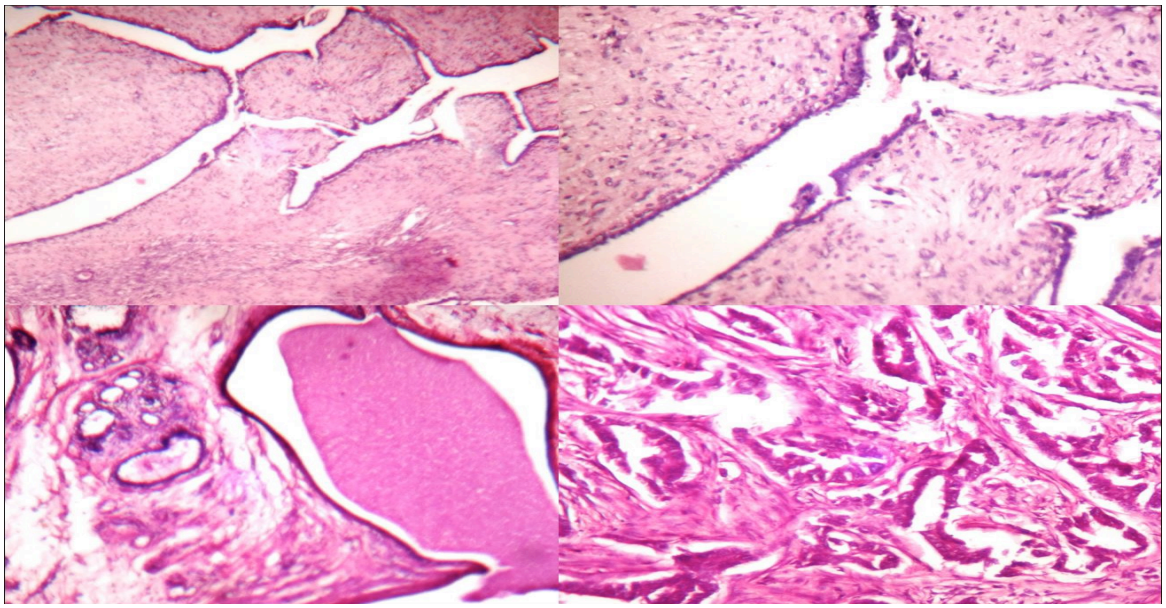

Figure 2: Upper right & left (H&E, 4Xx & 10x magnification) showing leaf like pattern with extensive stromal proliferation lined by ductal epithelial cells in phyllodes tumor. Lower right (H&E, 10X magnification) showing cystic change and duts lined by apocrine cells in fibrocystic disease. . Lower left (H&E, 10X magnification) showing pleomorhic ductal epithelial cells in cords and ductular pattern surrounded by desmoplastic reaction

Discussion

The results of our study showed FNA of breast lump to be a reliable method to diagnose breast lump with high accuracy. Triple assessment by clinical, radiological and FNAC can produce 99% accuracy for both benign and malignant lesions as false negative results can mislead a clinician and cause a delay in appropriate investigation, diagnoses, and treatment.[10] Different studies have shown that the most common lesions are benign. Early screening and diagnosis of breast lesions and categorization into different groups of breast pathology can be helpful in accurate management of the breast lesions. [11] Akçil et al. in his meta-analysis noted 72%–95% diagnostic accuracy on review of literature. Our study showed slightly higher accuracy than the range reported.[12]

The overall false negative rate in our study was 3.3% within the range reported in other studies, 2.5-17.9% reviewed by Chaiwun et al.[13] All false negative cases had histopathologic diagnoses of infiltrative ductal carcinoma as noted by Sudarat et al.[14] Factors contributing to false negative results

may be due to small tumor size; hypocellularity and inadequate sampling during aspiration; interpretative problems; particular histologic tumor types, such as, low nuclear grade carcinoma or scirrhous tumors.[15]

The accuracy of FNAC for obtaining a definite diagnosis also depends on the palpability of the lesion. Accuracy rate reported for FNAC is 34–58% for nonpalpable breast lesions, whereas accuracy rate for core needle biopsy is 94%.[16,17] FNAC has some pitfalls in the diagnosis of fibrocystic disease, adenosis, epithelial hyperplasia with or without atypia, apocrine metaplasia, radial scar, and papilloma, which may have to be correlated with imaging studies to rule out malignancy.[18] However, FNAC in the context of a rapid assessment of Breast lesions allows the same day diagnosis and early treatment of breast cancer, with the immediate reassurance and discharge of those with benign disease. When a large majority of patients have benign disease, FNAC provides an equivalent, if not better, method of evaluation of patients in a triple assessment.[19]

FNAC is not only useful in diagnosis and further planning of treatment without need for biopsy, but also helpful in prognostication of the tumor factors such as nuclear grading, mitotic index, hormone receptor status and DNA contents.[20] Breast lesions represents a major public health problem. FNAC is ideal for use in resource-limited health settings as well.[21] Recently, cytopuncture or Non aspiration cytology has gained popularity because of its ease of use, interpretation of results , its safety & claims that it yields specimens of superior diagnostic accuracy. [22] However FNAC is widely used technique.[23]

Conclusion

There are various techniques in diagnosing varied pathology in breast. FNAC is a highly reliable tool in the assessment of breast lump for the differential diagnoses of benign from malignant tumor without any surgical intervention. It has advantage of being highly accurate in expert hands, cost-effective and can be done as Out-patient procedure. It can be an excellent diagnostic modality in the context of a multidisciplinary approach. The current study showed that FNAC is a reliable method.

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