

Histopathological Correlation in the Cytological Assessment of Benign Breast Lesions

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Abstract:**Background:** Due to its safety, simplicity, and excellent diagnostic accuracy, FNAC has become a widely acknowledged tool for the identification of breast lesions. This study objective is to assess how well fine needle aspiration cytology (FNAC) diagnoses benign breast lesions.**Methods:** To evaluate the diagnostic efficacy of FNAC, histological analysis was performed on women who had benign breast lesions diagnosed by FNAC.**Results:** Out of 120 benign cases identified by FNAC, 116 were benign, whereas 2 cases of mastitis and 2 cases of fibrocystic disease, respectively, had infiltrating ductal carcinoma, indicating a 96.7% diagnostic accuracy for benign breast lesions.**Conclusion:** Since cytology and histology are correlated, FNAC is a reliable test for identifying and treating benign breast lesions.**Keywords:** Breast Lump, FNA, Benign Breast disease.

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Introduction

The safety, ease of use, and superior diagnostic accuracy of FNAC have made it a commonly used method for identifying breast lesions.[1] Very cost-effective when paired with clinical and mammography examinations postoperatively.[2] The main objective of FNAC is to differentiate between benign tumors, which can be managed conservatively, and malignant lesions, which demand more severe therapy[3]. Breast lesions are divided into several groups based on their propensity to develop into cancer.

Cancer risk is unaffected by inflammatory breast disease and non-proliferative breast disease. While carcinoma in situ is linked to a high risk, both proliferative breast disease with and without atypia carries a low to moderate risk.[4] Women are becoming more aware of the condition, and the anxiety and stress that go along with it drive them to believe that every breast symptom is a sign of cancer and drive them to seek treatment. Clinical examination alone cannot reliably identify a breast mass as benign or cancerous.[5] A diagnosis could be made using FNAC for only 10–30% of the price of a surgical biopsy [6]. In order to evaluate the diagnosis accuracy, this study looked at the distri-

bution of benign lesions in the breast using FNAC and histological correlation. The study's objectives were to understand the distribution of different benign lesions in breast lumps and to evaluate the diagnostic precision of FNAC in identifying breast lesions in females by comparing histology.

Material and Methods

This study was conducted at Department of Pathology, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar from May 2022 to October 2022. 120 female patients whose aged between 10-60 years attending outpatient department of JLNMC, 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 cytopathologist 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

Following a diagnostic FNAC in our pathology department, all 120 patients received an expert surgical operation once they were admitted to the hospital. The obtained excised specimens were histopathologically examined. Statistical tests were performed to analyze the results when the FNAC report and the final histopathological report were

compared. 116 of the 120 benign cases identified by FNAC as benign were benign, indicating a diagnostic accuracy of 96.7% for FNAC in identifying benign breast lesions. The age groups were separated into 10 to 19, 20 to 29, 30-39, 40 to 49, and over 50. The group 20-29 was the biggest of these. 76 were under the age of 20, 24 between 30 and 39, 8 between 10 and 19, 6 between 40 and 49, and 6 were beyond 50. Only 4 of the individuals with fibrocystic illness had a history of breast disease in their families.

56 cases of right-sided lesions and 64 cases of left-sided lesions were observed. 120 patients of breast disease underwent FNAC; fibroadenoma accounted for 78 (65.0%) of these cases, mastitis for 4, benign breast disease for 14, fibrocystic disease for 20, and phyllodes for 2 (1.66%).

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

| Cytological Diagnosis | No. of Cases | Percentage |
|------------------------------|--------------|------------|
| Fibrocystic disease | 20 | 16.66% |
| Fibroadenoma | 78 | 65.0% |
| Benign Proliferative Disease | 14 | 11.66% |
| Fibroadenosis | 2 | 1.66% |
| Mastitis | 4 | 3.33% |
| Phyllodes tumor | 2 | 1.66% |

With a diagnosis accuracy of 96.7% for benign breast disease on FNAC, 116 cases out of 120 patients with benign breast disease detected in cytology indicated benign breast disease on histological investigation. Four cases possessed characteristics of both fibroadenoma and fibrocystic disease, with a diagnostic accuracy of 100%, out of the 78 cases of fibroadenoma detected on FNAC. Two instances showed characteristics of both fibrocystic disease and fibroadenoma, and two cases had infiltrating ductal carcinoma of the breast on histology with diagnostic accuracy of 90%. Out of 20 cases of fibrocystic disease detected on

FNAC, 16 were fibrocystic disease. With a diagnosis accuracy of 100%, 14 instances of benign proliferative breast disease shared similar histological characteristics. The histology of two cases of fibroadenosis and two cases of phyllodes tumor on FNA shared similar characteristics, with a diagnostic accuracy of 100%. Two of the four instances of mastitis were diagnosed on histology as mastitis, while the other two were infiltrating ductal carcinoma of the breast, with a diagnostic accuracy of just 50%. Only 4 of the benign breast tumors identified on FNAC were cancerous.

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

| Breast Lesion | Cytology | HPE |
|--------------------------------------|----------|-----|
| Fibroadenoma | 78 | 74 |
| Fibrocystic disease | 20 | 16 |
| Fibroadenoma and fibrocystic disease | 0 | 6 |
| Benign Proliferative Breast Disease | 14 | 14 |
| Mastitis | 4 | 2 |
| Fibroadenosis | 2 | 2 |
| Phyllodes tumor | 2 | 2 |
| Infiltrating Ductal carcinoma | 0 | 4 |

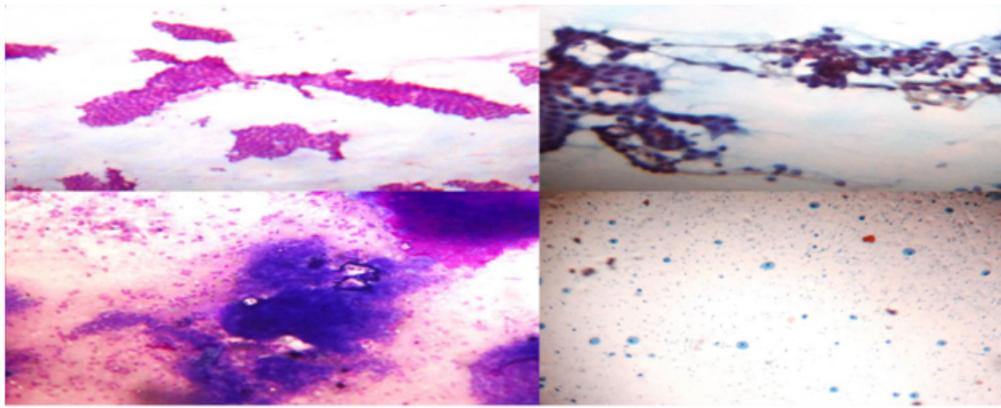


Figure 1: Upper right (H&E, 4x magnification) showing branching monolayered sheets of ductal epithelial cells in the background of bare nuclei in fibroadenoma. Upper left (pap, 4x magnification) showing ductal epithelial cells with apocrine cell change along with cyst macrophages in fibrocystic disease.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

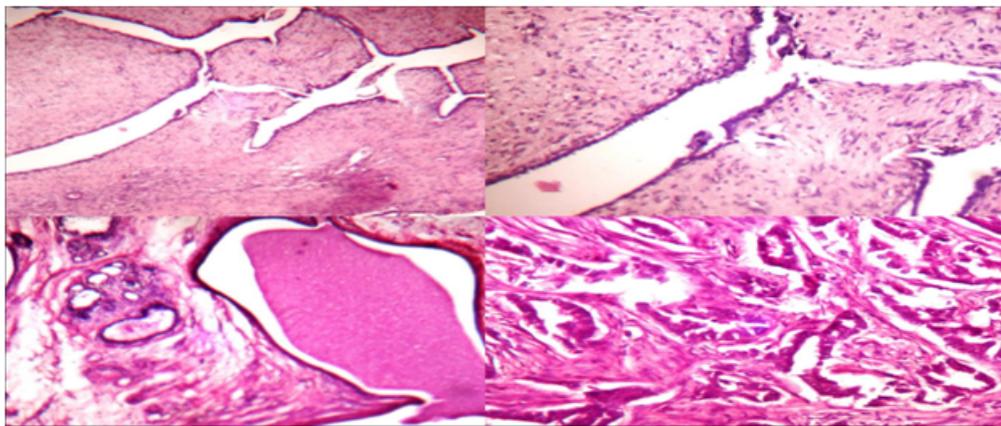


Figure 2: Upper right & left (H&E, 4Xx & 10x magnification) showing leaf like pattern with extensive stromal proliferation lined by ductal epithelial cells in phyllodes tumor. Lower right (H&E, 10X magnification) showing cystic change and ducts lined by apocrine cells in fibrocystic disease. Lower left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

Discussion

According to the findings of our study, FNA of breast lumps is an effective way to accurately diagnose breast lumps. As false negative results might mislead a physician and postpone necessary investigation, diagnosis, and treatment, triple assessment by clinical, radiological, and FNAC can provide 99% accuracy for both benign and malignant tumors.[7] Numerous studies have demonstrated that the majority of lesions are benign. Accurate care of breast lesions can be achieved through early detection, diagnosis, and classification of breast disease into various groups. [8]

Upon reviewing the literature, Akçil et al. found 72%–95% diagnosis accuracy. Our research revealed slightly better accuracy than the reported range.[9] Our study overall false-negative rate was 3.3%, falling within the range of other studies Chaiwun et al.(10) evaluated, which ranged from 2.5 to 17.9%.According to Sudarat et al., all false

negative cases had the histopathologic diagnosis of infiltrative ductal cancer.[11] Small tumor sizes, hypocellularity, poor sample during aspiration, interpretive issues, and specific histologic tumor types, such as low nuclear grade carcinoma or scirrhous tumors, are also potential causes of false negative results.[12] The palpability of the lesion affects how accurately FNAC can make a definitive diagnosis. with non-palpable breast lesions, the reported accuracy rate with FNAC is 34-58%, whereas the reported accuracy rate for core needle biopsy is 94%.[13,14] In order to rule out malignancy, imaging investigations may need to be coupled with FNAC in the diagnosis of fibrocystic disease, adenosis, epithelial hyperplasia with or without atypia, apocrine metaplasia, radial scar, and papilloma.[15] However, using FNAC to quickly analyze breast lesions enables the diagnosis and early treatment of breast cancer on the same day, as well as the instant reassurance and discharge of patients with benign disease. FNAC of-

fers a comparable, if not superior, way of patient evaluation in a triple assessment when the vast majority of patients have benign illness.[16] FNAC is effective in prognosticating tumor factors such nuclear grading, mitotic index, hormone receptor status, and DNA contents in addition to helping with diagnosis and further treatment planning without the need for a sample.[17] A serious public health issue is breast lesions. FNAC is excellent for usage in healthcare environments with limited resources.[18] Because of its simplicity of use, ease of interpretation of data, safety, and claims that it produces specimens with greater diagnostic accuracy, cyst puncture or non-aspiration cytology has recently grown in popularity. [19] But FNAC is a widely employed approach.[1]

Conclusion

There are numerous methods for identifying different breast pathologies. Without requiring any surgical intervention, FNAC is a very reliable method for assessing breast lumps and differentiating benign from malignant tumors. It benefits from being a cost-effective, highly accurate technique that may be completed as an outpatient procedure. In the context of a multidisciplinary approach, it can be a great diagnostic method. The recent investigation demonstrated the validity of the FNAC approach.

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