ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 6, 2024

COMPARISON OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) AND HISTOPATHOLOGY IN THE DIAGNOSIS OF FEMALE BREAST LUMPS

[1]Dr. Raveena Kaur, [2]Dr. Gopal Swaroop Bhargava, [3]Dr. Seema Mittal,

[4]Dr. Marshal Nagpal, [5]Dr. Amuleek Kaur

Department of General Surgery, Sri Guru Ram Das Institute of Medical Sciences and Research, Vallah, Sri Amritsar, Punjab, India

Corresponding Author:

Dr. Gopal Swaroop Bhargava (gsbhargava914@gmail.com)

ABSTRACT

BACKGROUND: Breast lump is one of the common surgical problems encountered in female patients. The goal of pathological diagnosis is to distinguish between aggressive carcinomas requiring aggressive treatment and benign lesions that allow for a more conservative approach.

METHOD: A cross-sectional study was conducted in which the cytological diagnosis of palpable lesion of the breast was compared with histopathological diagnosis to find sensitivity, specificity, negative predictive value (NPV), and positive predictive value (PPV) of FNAC in breast lumps. A total number of 62 fine needle aspiration cytology were performed. Every patient subjected to FNAC underwent a definitive surgical procedure and was subjected to histopathology.

RESULTS: Statistical analysis was performed on the tabulated data and sensitivity and specificity with PPV and NPV were obtained. Of all 62 patients selected, only 2 were false negative for malignancy i.e., they were detected as benign lesions on FNAC but found to be malignant on histopathology. Hence, the sensitivity of the study was 92.3% and the specificity for malignant lesions was 100%. The PPV was 100% and the NPV was 94.7%

CONCLUSION: Histological correlation indicated FNAC to be a good diagnostic tool as the p-value turned out to be 0.001, considered extremely significant. It gives a good histological correlation.

Keywords: FNAC, histopathology, excision biopsy, Breast cancer, Breast lumps.

Introduction:

There is increased anxiety and stress among women, who perceive every symptom of breast as breast CA (cancer), compelling them to seek medical advice. Sometimes, it becomes difficult to say whether a suspicious lump is benign or malignant simply by clinical assessment.[1] A triple assessment test consisting of clinical examination, mammography, and FNAC is considered the gold standard in the definitive assessment of breast lumps.[2]

The final treatment of malignant breast lesions (mastectomy, chemotherapy, or radiotherapy) may proceed based on FNAC, without a tissue biopsy, when all three assessments reveal consistent findings. However, some insist on a core needle biopsy for all index breast lesions.[3]

One of the most frequent appearances in outpatient departments is a woman with a breast lump due to increased public knowledge, particularly regarding breast diseases. The "Triple Test," which consists of a clinical examination, a mammogram, and FNAC, is used to diagnose breast masses.[4]

When performed by skilled cytopathologists, FNACs can have a high diagnosis accuracy of up to 98.9% in some series.[5,6] When all three modalities are nonconcordant, as in the case of cell

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 6, 2024

block preparations in one research, the diagnostic accuracy of FNAC increases even more to nearly 100%, making FNAC the most dependable component of the triple test.[7]
A breast lump that can be palpated is extremely concerning for the patient, regardless of whether it is benign or cancerous.[8] Thus, before receiving a final course of therapy, it is necessary to differentiate between benign and malignant lesions. A thin (22–24 G) needle attached to an airtight syringe is inserted through the skin during FNAC, a simple procedure, to extract tissue or fluid from a solid or cystic mass. The extracted material is expertly spread onto a glass slide, allowed to air dry or be fixed, quickly stained, examined, and a diagnosis is made right away.[9] FNAC preserves tactile sensitivity, permits multidirectional passes for a wider lesion sample, and enables immediate reporting when required.[10]
The gold standard or point of reference for determining the diagnostic precision of cytological smears is still histopathologic investigations. However, surgical biopsy—either excision or core needle biopsy [CNB]—requires extensive preoperative care, is more expensive than FNAC, requires hospital reservations, complicated medical-legal issues, requires a large staff, takes a long time to process tissue, produces laborious and time-consuming results, complications, interpretations, and causes patient discomfort such as pain, infection, bleeding, and hemorrhage.[8,11] In addition, there is a risk that the tumor will seed itself along the needle track in core biopsy cases.[12] Therefore, FNAC aids in determining when surgery is necessary. Although conventional open biopsy is thought to be the best method for diagnosis confirmation, it has a high rate of morbidity, is expensive, intrusive, takes a long time, and exposes the patient to needless anxiety as well as multiple surgical procedures.[13]

Aim: Comparison of Fine Needle Aspiration Cytology (FNAC) and Histopathology in Diagnosis of Female Breast Lumps.

Objectives:

• To compare histopathological examination of female breast lumps with their FNAC reports.
• To determine the specificity, sensitivity, positive predictive value, and negative predictive value of FNAC.

Inclusion Criteria:

• All female patients more than 15 years of age presenting to the general surgery department with a breast lump

Exclusion Criteria:

• Known case of carcinoma breast
• Breast abscess
• Breast hematomas

Materials And Methods: A cross-sectional study was conducted on female patients with breast lumps coming to the Department of General Surgery, Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Amritsar, Punjab from January 2023 to March 2024. 62 cases of breast lumps were enrolled in the study after following inclusion & exclusion criteria. A detailed history and clinical examination record were maintained. Fine needle aspiration was performed for various breast lumps. Appropriate surgical interventions were planned and performed as per FNAC results and the specimens obtained during the surgical procedure were investigated with the histopathological examination (HPE). Using the standard statistical formulae, the sensitivity, specificity, PPV, and NPV of FNAC were calculated in this study.

Results:

Table 1: Distribution Of The Patients Based On The Quadrant Involved

Quadrant	No. of cases	%age
Lower inner	2	3.2

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 6, 2024

Lower outer	7	11.3
Upper inner	23	37.1
Upper outer	30	48.4
Total	62	100.0

In the present study, the upper outer quadrant was the most commonly involved quadrant 30 [48.4%] cases and the lower inner quadrant was the least involved had 2 [3.2%] cases.

Table 2: Distribution Of The Patients Based On Their FNAC Report

FNAC	No. of cases	%age
IDC NOS	22	35.5
FIBROADENOMA	29	46.8
GALACTOCELE	2	3.2
INFLAMMATORY SMEAR	2	3.2
LIPOMA	3	4.8
LOBULAR CA	2	3.2
PHYLLODES TUMOUR	2	3.2
Total	62	100.0

In this study, FNAC of the breast lump shows fibroadenoma (46.8%) was the most common cause of breast lump followed by infiltrating ductal carcinoma not otherwise specified (IDC NOS) (38.7%). On FNAC 2 cases (3.2%) of inflammatory smear, 3 cases (4.8%) of lipoma, 2 Cases (3.2%) of lobular CA, and 2 cases (3.2%) of phyllodes tumor were seen.

Table 3: Distribution Of The Patients Based On Their Histopathology Report After Excision Biopsy

Excision biopsy	No. of cases	%age
FIBROADENOMA	29	46.8
GALACTOCELE	2	3.2
IDC NOS	24	38.7
LIPOMA	3	4.8
LOBULAR CA	2	3.2
PHYLLODES TUMOUR	2	3.2
Total	62	100.0

In this study histopathology of the breast lump shows fibroadenoma (46.8%) was the most common cause of breast lump followed by infiltrating ductal carcinoma not otherwise specified (38.7%). On FNAC 2 cases (3.2%) of inflammatory smear were seen which were found to be infiltrating ductal carcinoma on histopathology. 3 cases (4.8%) of lipoma, 2 Cases (3.2%) of lobular CA, and 2 cases (3.2%) of phyllodes tumors were seen in histopathology.

Table 4: Comparison Of Breast Lump On Their FNAC And Histopathology Report

FNAC	HISTOPATHOLOGY	
	BENIGN (HPE)	MALIGNANT (HPE)
BENIGN (FNAC)	36 (58.1%)	2 (3.2%)
MALIGNANT (FNAC)	0	24 (38.7%)

X^2: 54.10; df: 1; p=0.001

The association between FNAC diagnosis and Histopathology was analyzed. Of all 62 patients selected, only 2 were false negative for malignancy i.e., they were detected as benign

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 6, 2024

lesions on FNAC but found to be malignant on histopathology. The p-value turned out to be 0.001, considered extremely significant.

Table 5: Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value Of FNAC

FNAC	HISTOPATHOLOGY	
	Malignant (HPE)	Benign (HPE)
Malignant (FNAC)	24	0
Benign (FNAC)	2	36

Sensitivity = [True positive / (True positive + false negative)] × 100%

Specificity = [True Negative / (True Negative + False positive)] × 100%

PPV = [True Positive / (True Positive + False Positive)] × 100%

NPV = [True Negative / (True Negative + False Negative)] × 100%

Sensitivity: 92.3% PPV: 100.00%

Specificity: 100.00% NPV: 94.7%

Discussion:

In the current study, 62 female patients with palpable breast lumps were recruited. Based on the results of the aspiration cytology, each patient underwent either a lumpectomy or a mastectomy as the definitive surgical procedure. The aspiration cytology results were then compared to the final histology report to evaluate the cyto-histologic correlation.

In the present study, the upper outer quadrant was the most commonly involved quadrant 30 [48.4%] cases and the lower inner quadrant was the least involved had 2 [3.2%] cases. This finding implies that the upper outer quadrant's higher percentage of benign and malignant disease results from the quadrant's larger volume of breast tissue. Greater areas of fibroglandular tissue may indicate a higher number of cells at risk of carcinogenesis and/or an increased rate of epithelial proliferation, as epithelial cells are the source of breast cancers.[14,15] Unfortunately, thick breast tissue can impede medical professionals' ability to identify issues during mammography.[16]

Similarly, Khemka A. et al.,[17] in their study found upper outer quadrant of the breast had the maximum pathologies.

In the present study, the most commonly occurring breast lump is fibroadenoma followed by infiltrating ductal carcinoma [IDC-NOS]. The findings in this study also correlated with others like Mudholkar et al.,[18] Bhalla et al.,[19] Kapoor et al.[20]

Our study showed a Sensitivity of 92.3%, Specificity of 100.00%, PPV of 100.00%, and NPV of 94.7% of FNAC.

A high sensitivity and positive predictive value proved that a positive FNAC in the breast means a definite diagnosis of the concerned pathology if compared with the final histology report. The high specificity and a high negative predictive value for malignancy illustrated the high accuracy of FNAC in diagnosing malignancy in the breast.

Our results were similar to the studies done by Arul P et al,[10] Fimate.[21]

The association between FNAC diagnosis and Histopathology was analyzed. Of all 62 patients selected, only 2 were false negative for malignancy i.e., they were detected as benign lesions on FNAC but found to be malignant on histopathology. The p-value turned out to be 0.001, considered extremely significant.

Conclusion: Histological correlation indicated FNAC to be a good diagnostic tool as the p-value turned out to be 0.001, considered extremely significant. Hence, diagnosis of breast

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 6, 2024

lumps based on FNAC should be a practice as there is a high correlation with histopathological findings.

Of all 62 patients selected, only 2 were false negative for malignancy i.e., they were detected as benign lesions on FNAC but found to be malignant on histopathology. This study shows Sensitivity: 92.3%, Specificity: 100.00%, PPV: 100.00%, and NPV: 94.7% of FNAC. Thus, there should be no hesitation in concluding that FNAC is a very important preliminary diagnostic test in palpable breast lumps and the results show a high degree of correlation with the final histopathology report.

Acknowledgment:

The authors would like to thank the Department of General Surgery, Sri Guru Ram Das Institute of Medical Sciences and Research Center, Amritsar for providing the research material for this study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

References:

1. Yong WS, Chia KH, Poh WT, Wong CY. A comparison of trucut biopsy with fine needle aspiration cytology in the diagnosis of breast cancer. Singapore Med J. 1999; 40(9):587-9.
2. Jindal U, Singh K, Kochhar A. Fine needle aspiration cytology of breast lumps with histopathological correlation: A four year and eight month study from rural India. Internet J Pathol. 2012;13(3):20-4.
3. Kocjan G, Bourgain C, Fassina A, Hagmar B, Herbert A, Kapila K et al. The role of breast FNAC in diagnosis and clinical management: a survey of current practice. Cytopathology. 2008;19(5):271-8.
4. Ahmed I, Nazir R, Chaudhary M, Kundi S. Triple assessment of breast lump. J Coll Phys Surg Pak. 2007;17(9):535–8.
5. M. H. Bukhari, M. Arshad, S. Jamal et al., "Use of fine-needle aspiration in the evaluation of breast lumps," Pathology Research International, vol. 2011, Article ID 689521, 10 pages, 2011.
6. S. I. Panjvani, B. J. Parikh, S. B. Parikh et al., "Utility of fine needle aspiration cytology in the evaluation of breast lesions," Journal of Clinical & Diagnostic Research, vol. 7, no. 12, pp. 2777– 2779, 2013.
7. I. Ahmed, R. Nazir, M. Y. Chaudhary, and S. Kundi, "Triple assessment of breast lump," Journal of the College of Physicians and Surgeons Pakistan, vol. 17, no. 9, pp. 535–538, 2007.
8. Pandya AN, Shah NP. Breast fine needle aspiration cytology reporting: a study of application of probabilistic approach. Indian Medical Gazette 2013: p. 54-9.
9. Orell SR, Sterrett GF, Whitaker D, et al. Breast. Fine needle aspiration cytology. 4th edn. Churchill Livingstone 2005: p. 165-217.
10. Arul P, Masilamani S. Application of National Cancer Institute recommended terminology in breast cytology. J Can Res Ther 2017;13(1):91-6.
11. Kumar CA, Kumar PA, Tarannum K, et al. Study of breast lesions in a tertiary care centre: a retrospective study. Med Phoenix: An Official Journal of NMC, Birgunj, Nepal 2017;2(1):48-51.

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 6, 2024

12. Daramola AO, Odubanjo MO, Obiajulu FJ, et al. Correlation between fine-needle aspiration cytology and histology for palpable breast masses in a Nigerian Tertiary Health Institution. International Journal of Breast Cancer 2015;2015:742573.
13. Noroozi A, Tahmasebi R. Factors influencing breast cancer screening behavior among Iranian women. Asian Pacific Journal of Cancer Prevention. 2011;12(5): 1239-44.
14. Butt S, Borgquist S, Anagnostaki L, Landberg G, Manjer J. Parity and age at first childbirth in relation to the risk of different breast cancer subgroups Int J Cancer. 2009;15(125):1926–34.
15. Kumar V, Abbas AK, Fausto N, Mitchell R. Robbins Basic Pathology 20078th ed Philadelphia Elsevier Saunders:173–224.
16. Laura W. Understanding Breast Cancer-A Guide for People with Cancer, their Families and Friends 2011 Victoria The Cancer Council NSW:76.
17. Khemka A, Chakrabarti N, Shah S, Patel V. Palpable breast lumps: Fine-needle aspiration cytology versus histopathology: A correlation of diagnostic accuracy. Internet J Surg. 2009;18(1):1-25.
18. Mudholkar VG, Mashal SN, Kawade SB. Histopathological Study of Neoplastic Lesions of Breast. Ind Med Gazette 2012;45:118-22.
19. Bhalla A, Manjari M, Kahlon SK, Kumar P, Kalra N. Cytokeratin 5/6 expression in benign and malignant breast lesions. Indian J Pathol Microbiol. 2010;53(4):676-80.
20. Sudershan K, Ashwani K, Singh A, Singh H, Singla R. Varied pattern of breast diseases-A Study of 443 cases. IOSR J Med Sci. 2016;15(3):36-49.
21. Fimate P. A Correlative Study of Fine Needle Aspiration Cytology with Histopathology of Female Breast Lesions. J Evolution Med Dent Sci. 2020;9(14):1135-40.