

Original Article

Diagnosis Of Breast Lesions- Fine Needle Aspiration Cytology (Fnac) Or Core Needle Biopsy?

Ankita Baghel^{1*}, CSBR Prasad ², M.L. Harendra Kumar³

1. Post graduate, Department of Pathology, Sri Devaraj Urs Medical College
2. Professor, Department of Pathology Sri Devaraj Urs Medical College
3. Professor of Pathology, Dean, Sri Devaraj Urs Medical College, Sri Devaraj Urs Academy of Higher Education and Research, Tamaka, Kolar, Karnataka, India.

Abstract

Breast lesions are very common among Indians, being the 2nd most common cancer site. Diagnosis of breast lesions is routinely done by triple assessment. FNAC and Core needle biopsy (CNB) being the method of choice for Pathological diagnosis. **Objectives:** Are to compare sensitivity and specificity of FNAC and CNB in diagnosing breast lesions and to evaluate their diagnostic usefulness and also assessing invasion, tumor grade and ER/PR status. **Materials and Methods:** Forty two patients, who presented to RL Jalappa hospital with breast lesions, underwent physical examination and both FNAC and CNB were done. Grading and ER/PR status was done for the malignant tumors using standard criteria on the same day using cytology smears and frozen sections. The results were compared with histopathological findings in excised specimens. **Result:** CNB was found to have higher sensitivity and specificity as compared to FNAC in diagnosing breast lesions. In all malignant cases assessment of invasion by core biopsy correlated well with excised specimens. **Conclusion:** CNB was able to give histological diagnosis with additional information which will affect the treatment.

Keywords: FNAC, Core biopsy, Estrogen receptor, Progesterone receptor

Introduction

It has been decades since small samples of tissue have been aspirated using a needle to diagnose lesions on various body parts. Breast lumps were identified very suitable for the technique due to its easy accessibility.^[1] The use of fine needle aspiration smears for diagnostic purposes was reported as early as 1933 by Stewart's series of 2500 specimens which included 500 breast lesions^[2] but FNA technique was not established as a vital part of assessment for breast lesions until 1968, when

2111 FNAC results were published by Franzen and Zajicek.^[3]

Breast lesions are very common among Indians, being the 2nd most common cancer site.^[4] Diagnosis of breast lesions is routinely done by triple assessment.^[5] FNAC and CNB being the method of choice for pathological diagnosis.^[6] Though FNAC is easy to perform, it has the following inadequacies:-

1. FNAC cannot reliably distinguish Invasive from Non-invasive lesions.^[7] This pre-operative distinction is very crucial in planning surgical treatment and deciding an Neo-adjuvant chemotherapy.
2. Though Cytological grading correlates with biopsy grading of the tumour ^[6] it has no role to play in patient management be-

*Corresponding Author

Dr. Ankita Baghel
Post graduate, Department of Pathology,
Sri Devaraj Urs Medical College, SDUAHER,
Kolar-563101, Karnataka, India.
E-mail : kuttayvm@gmail.com

cause of its inability to identify invasive lesions.

3. Though cytological Immunocytochemistry is performed on FNAC material it is unreliable.^[6] Biopsy material is preferred for Immunohistochemistry.^[8]
4. For Molecular studies biopsy offers better material from FNAC.

Aims And Objectives

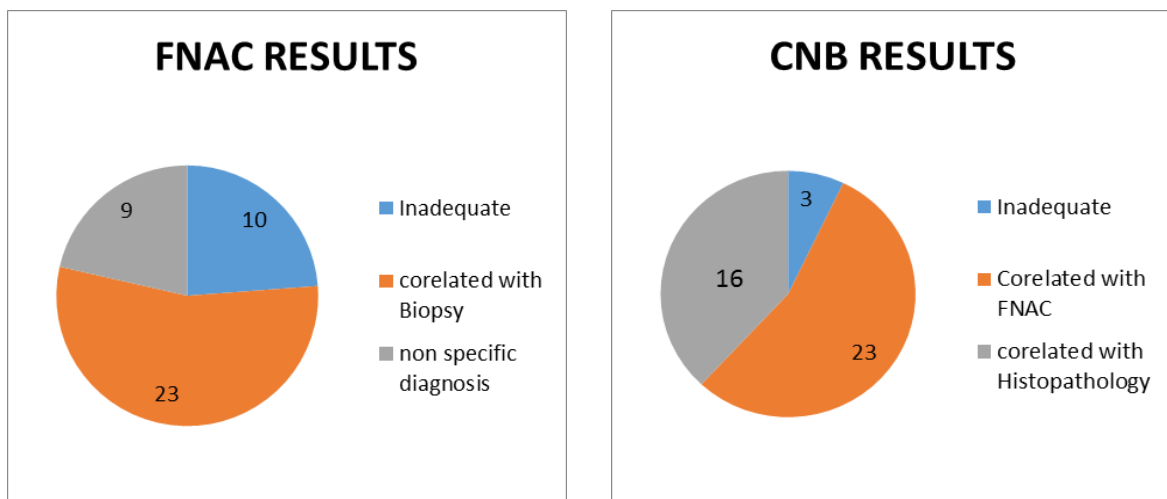
The objective of the study was to compare sensitivity and specificity of FNAC and core biopsy in diagnosing breast lesion and to evaluate their diagnostic usefulness and also assessing invasion, tumour grade and ER/PR status.

Materials and Methods

42 patients who presented to RL Jalappa hospital from august 2014- January 2015 (Duration 6 months) with breast lesions underwent physical examination and both FNAC and CNB was done, only first attempt FNAC results were taken. Grading and ER/PR status was done for the malignant tumours using the standard criteria on the same day using cytology smears and frozen sections (from core biopsy tissue). The results were compared with histopathological findings in excised specimens. Post CT/RT cases were excluded from the study.

Results

23 out of 42 cases co-related for FNAC and CNB with histopathological diagnosis. In 6 cases definite diagnosis was established in CNB cases and not by FNAC. In 7 cases FNAC was inadequate, and CNB diagnosis co-related with histopathological diagnosis. In 3 cases both FNAC and CNB were inadequate, and for 3 cases no histopathological diagnosis was made as no specimen was received.



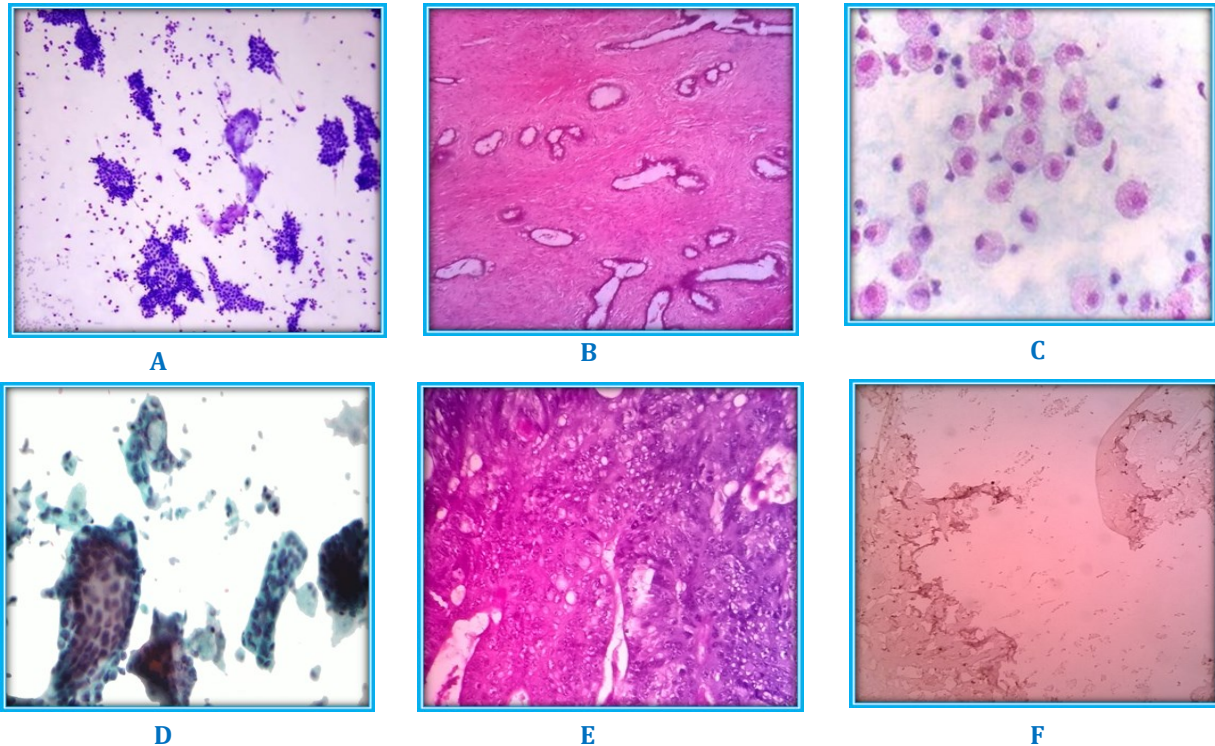


Figure : A- FNAC smear-Fibroadenoma, B- Trucut biopsy- Fibroadenoma, C- FNAC smear- Fibrocystic disease, D- FNAC smear- Ductal carcinoma, E- Trucut biopsy- Ductal carcinoma, F- ER positive Ductal carcinoma.

Discussion

FNAC and core biopsy form pillars of triple test and should always be in co-relation with clinical and imaging findings. Despite many advantages of FNAC, it has numerous limitations like invasion status cannot be determined, ER,PR and Her2 status assessment is not sensitive and expensive. This method is also characterized by lower sensitivity and specificity along with higher rate of non-diagnostic results. Table 1

Table 1. Comparison and contrast of diagnostic modalities. CNB and FNAC.

FEATURES	CNB	FNAC
Sensitivity	High	Low
Specificity	High	Low
Inadequacy	Variable	Variable
Immunohistochemistry	Reliable	Less reliable
Tumour grading	Can be done	Not done
Detection if in-situ component	Possible	Not possible
Lymphovascular emboli	Possible	Not possible
Perineural invasion	Possible	Not possible
Complications	Low	Very low

A Study by Paola et al, 35% of the lumps that were non-diagnostic or benign at cytological examination (C1-2) had a positive biopsy. 16% of C3 were neoplastic lesions. 49% cases in which cytology identified the nodule as suspicious or positive for malignancy (C4-5), the diagnosis was confirmed by biopsy.^[9]

In a metanalysis based on 20 publications, the authors all demonstrated sensitivity of FNAB ranging from 35%-95% and was found to be lower than CNB(85%-100%). Specificity also showed similar results.(FNAB 48%-100%. CNB 86%-100%).^[10] This analysis indirectly showed that results of CNB are more reliable. CNB gives us information related to cancer which has therapeutic importance. Features like presence of invasion, histological type, tumour grade, ER/PR receptors, her2neu status and Ki-67 index. The sensitivity of marker and receptor assessment is 96% for ER, 90% for PR and 87% for her 2 neu.^[11]

Hukkinen et al, found that though FNAC is a low cost procedure, the frequent additional examinations due to inadequate results makes the total cost of FNA more than that of CNB.¹² the authors estimated 150 Euros for FNA and that of CNB as 176 Euros. However when the cost of additional tests and further examinations cost was added, FNA costed 294 Euros and that of CNB as 233 Euros, making diagnosis with CNB 24% cheaper than that of FNA.

Similar assumptions were drawn by Gruber et al. who had compared cost of USG-Guided CNB with surgical resection.^[13] CNB lowered the cost by almost 30% compared to mastectomy and 60% of the women were also not operated after considering the result of CNB.

Table 2. Compare different parameters in FNAC and CNB in studies that have compared both these diagnostic modalities.

Studies	Modality	Sensitivity	Specificity	Inadequacy
Lieske et al ⁷	FNAC	82	-	8
	CNB	93	-	5
Berner et al ¹⁴	FNAC	92.9	63.7	19.1
	CNB	88.3	94.5	1.1
Bukhari et al ¹⁵	FNAC	80	99	-
	CNB	94	100	-
Westenend et al ¹⁶	FNAC	92	82	7
	CNB	88	90	7
Current study	FNAC	60		23.8
	CNB	97		7.1

Conclusion

Core biopsy was found to have higher sensitivity and specificity as compared to FNAC in diagnosing breast lesions. In all malignant cases assessment of invasion by core biopsy correlated well with excised specimens. CNB is far superior to FNAC, especially in cases of uncertainty where it is preferable to proceed directly with CNB, which may also determine additional prognostic and predictive markers. Initially FNAC is less expensive, but the actual costs involved tend to be higher for FNAC as it is less accurate and a CNB is often required. In accordance with recent publications, we can confirm the full validity of CNB in the diagnostic approach of breast lesions.

References

- Rosen PP. Rosen's breast pathology. Philadelphia: Lippincott-Raven Publishers, 1997.
- Stewart FW. The diagnosis of tumours by aspiration. *Am J Pathol* 1933;9:801-11.
- Zajicek J, Franzen S, Jakobsson P, Rubio C, Unsgaard B. Aspiration biopsy of mammary tumors in diagnosis and research – a critical review of 2,200 cases. *Acta Cytol* 1967;11:169-75.
- Sankaye SM, Dongre SD. Cytological study of palpable breast lumps presenting in an Indian rural setup. *J Med Paediatr Oncol* 2014;35:159-64.
- Kline TS, Kline IK, Howell LP. Guides to Clinical Aspiration Biopsy Breast. Philadelphia: Lippincott Williams & Wilkins Publishers, 1999.
- Willems SM, Deurzen CHM, Diest PJV. Diagnosis of breast lesions: fine-needle aspiration cytology or core needle biopsy? A review. *J Clin Pathol* 2012;65:287-92.
- Lieske B, Ravichandran D, Wright D. Role of fine-needle aspiration cytology and core needle biopsy in the preoperative diagnosis of screen-detected breast carcinoma. *Brit J Cancer* 2006;95:62-66.
- Kwok TC, Rakha EA, Lee AHS, Grainge M, Green AR, Ellis IO et al. Histological grading of breast cancer on needle core biopsy: the role of immunohistochemical assessment of proliferation. *Histopathology* 2010; 57, 212-19.
- Paola Pagni Flaminia Spunticchia Simona Barberi Giuliana Caprio Carlo Paglicci DAI Ematologia, Oncologia, Anatomia Patologica e Medicina Territoriale, University of Rome 'La Sapienza', Rome, Italy (2014)
- Willems SM, VanDeurzen CHM, VanDiest PJ: Diagnosis of breast lesions: Fine- needle aspiration cytology or core needle biopsy? *J Clin Pathol* 2012; 65: 287-292.
- Wood B, Junckernstorff R, Sterrett G, Frost F, Harvey J, Robbins P: a comparison of immunohistochemical staining for estrogen receptors, progesterone receptors and her-2 in breast biopsies and subsequent excision. *Pathology* 2007; 39: 391-395.
- Hukkinen K, Kivisaari L, Heikkilä PS, Von SK, Leidenius M: Unsuccessful preoperative biopsies, fine needle aspiration cytology or core needle biopsy, lead to increased costs in the diagnostic workup in breast cancer. *Acta oncol* 2008; 47: 1037-1045.
- Gruber R, Walter E, Helbich TH: Cost comparison between ultrasound-guided 14-G large core breast biopsy and open surgical biopsy: an analysis from Austria. *Eur J Radiol* 2010; 74: 519-524.
- Berner A, Davidson B, Sigstad E, Risberg B. Fine needle aspiration cytology vs. core biopsy in diagnosis of breast lesions. *Diagn Cytopathol* 2003;29:344-348.
- Bukhari MH, Akhtar ZM. Comparison of accuracy of diagnostic modalities for evaluation of breast cancer with review of literature. *Diagn cytopathol* 2009;37:416-24.
- Westenend PJ, Sever AR, Beekman-De VHJ, Liem SJ. A comparison of aspiration cytology and core needle biopsy in the evaluation of breast lesions. *Cancer* 2001;93:146-50.