

Study of fine needle aspiration cytology of breast lesions along with histopathological correlation

Yogendra P^{1*}, Rangaswamy R²

¹Assistant Professor, ²Professor, Dept. of Pathology, ¹Navodaya Medical College, Raichur, ²Kempegowda Institute of Medical Sciences, Bengaluru, Karnataka.

***Corresponding Author:**
E-mail: yogi5300@gmail.com

Abstract

Background: Fine needle aspiration cytology is very useful in diagnosis of breast lesions when properly correlated with Histopathology.

Aims: To evaluate Breast lesions by FNAC and comparison with Histopathology.

Materials and Methods: This is a retrospective study done over a period of year in Navodaya Medical College, Raichur. A total of 100 cases of breast lesions were evaluated for FNAC and Histopathology correlation.

Results: FNAC of breast lesions in study had a sensitivity of 96%, specificity of 95%, diagnostic accuracy of 94%, positive predictive value of 93%, and negative predictive value of 96%.

Conclusions: FNAC smears of Breast lesions show good accuracy when correlated with Histopathology and useful for optimal diagnosis.

Keywords: Lesions of Breast, Fine Needle cytology, Histopathology.

Introduction

Fine Needle Aspiration Cytology now a days has good scope to detect malignant lesions, benign lesions for planning the therapeutic protocol and eventual follow-up. Along with clinical examination, Mammographic examination, Fine Needle Aspiration Cytology is very useful⁽¹⁻³⁾.

FNAC is used in evaluation of palpable and non-palpable breast lesions. FNAC is safe, minimally invasive, Cost effective and equal to biopsy. In spite of some shortcomings use in daily practice has proved aspiration value in most accurately findings⁽⁴⁻⁶⁾.

Materials and Methods

Material for this study was obtained retrospectively over a period of one year (2013–2014) from the Department of Pathology, Navodaya Medical College, Raichur. History was taken along with physical examination of breasts like size, mobility, signs of malignancy lymph nodes of axillary region.

22 or 23 G needle attached to a 5 cc disposable syringe with Franzen handle was used to aspirate from lesions. Smears stained with Hematoxylin and Eosin (H and E) and Pap stain, MGG (May Grunwald and Giemsa stain).

Fluid from cystic lesions were centrifuged for deposits. 100 breast aspirates and follow-up was done by excision biopsy and mastectomy. Aspirates were evaluated and final diagnosis was given as:

1. Benign
2. Atypical/indeterminate
3. Suspicious
4. Malignant.

Results

One hundred breast lesions (age range, 16-70 years; mean age, 43 years; side, left breast [73.50%] > right breast [26.50%]) with histopathological confirmation was observed.

On histopathology, out of 100 cases, 61 were benign, 3 were malignant in situ, and 36 malignant. Fibroadenoma and Fibrocystic change were common benign lesions in the findings. Infiltrating Ductal Carcinoma, Medullary carcinoma were common malignant lesions.

Fibro adenoma, Fibrocystic disease, Atypical ductal hyperplasia, Fat necrosis, Abscess, Mastitis were common diagnosis in the study.

Malignancy breast lesions FNAC had a sensitivity of 96%, specificity of 95%, diagnostic accuracy of 94%, positive predictive value of 93%, and negative predictive value of 96%.

Statistics	Present Study	Kamphausen BH et al., ⁷	Kuo YL et al., ⁸	Nguansangiam S et al., ⁴	Nggada et al., ⁹
Sensitivity	96	90	100	92.5	95.7
Specificity	95	100	94	90.2	98.7
PPV	94	100	86.12	99.4	-
NPV	96	90	76.7	85	-
Accuracy	97	-	-	91.2	97.7

Discussion

Few cases of the breast lesions were showing many neutrophilic infiltration which were diagnosed as Breast Abscess because of some injuries. Many cases mimicked Malignancy with redness and swelling. But later diagnosed as Benign Breast Abscess on Biopsy.

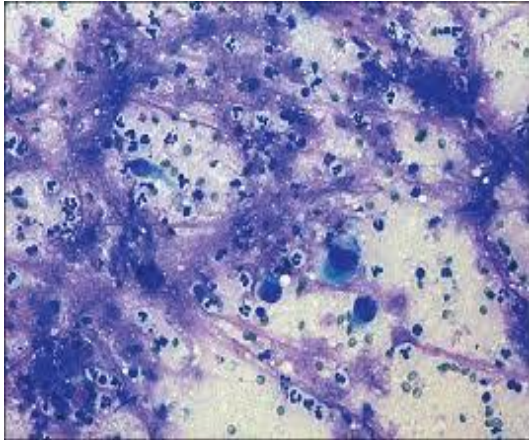


Fig. 1: Breast Abscess.

In some cases neutrophilic infiltration were seen in Granulomatous Mastitis later confirmed by biopsy.

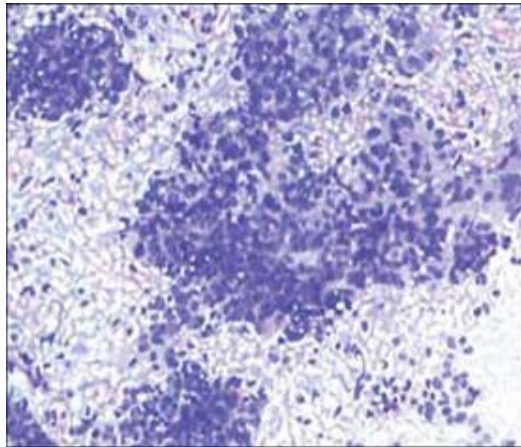


Fig. 2: Granulomatous lesion with neutrophils.

Apocrine cells or oncocytes, some of which show large hyperchromatic nuclei, occur singly or in small, cohesive flat sheets. Various numbers of foam cells may be present. Sometimes fragments of stroma, composed of loosely structured bundles of spindly, elongated fibroblasts with benign nuclei, may be observed. Necrotic material may be present in cases with marked dilatation of ducts, containing inspissated secretions (duct stasis and inflammation).

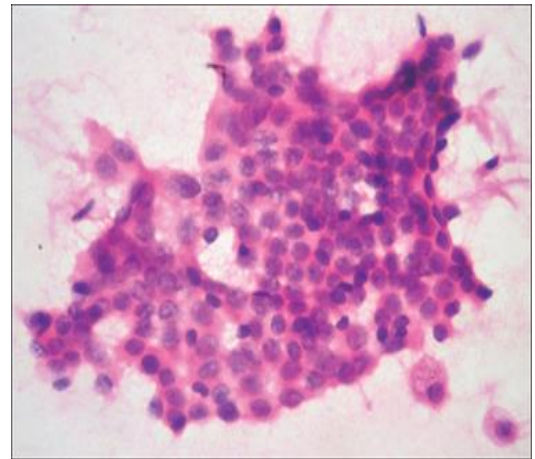


Fig. 3: Fibrocystic change.

The cytologic distinction of intraductal carcinoma in situ from an invasive cancer is not reliable. In its classic presentation, smears from high-grade ductal carcinoma in situ are composed of spherical, rather compact clusters of large cancer cells with few dispersed cells. In the comedo type, necrotic material may be present^(10,11).

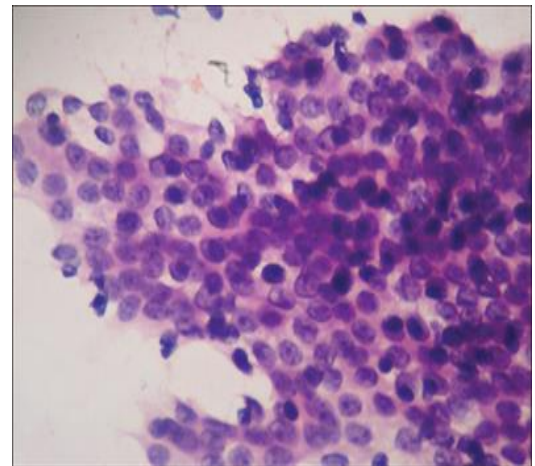


Fig. 4: Atypical ductal hyperplasia.

Atypical ductal hyperplasia had the same cytologic features as DCIS and invasive carcinoma, which strongly suggests that it is at least a precursor lesion of DCIS, and, even more likely, an early malignant lesion of mammary ducts of uncertain behavior.

Case of Insitu was diagnosed as malignant on cytology. Diagnosing both invasive ductal carcinoma and DCIS is difficult, as both have same features. Features favoring ductal carcinoma in situ include spherical, rather compact clusters of large cancer cells with few dispersed cells. In the comedo type, necrotic material may be present^(10,12,13).

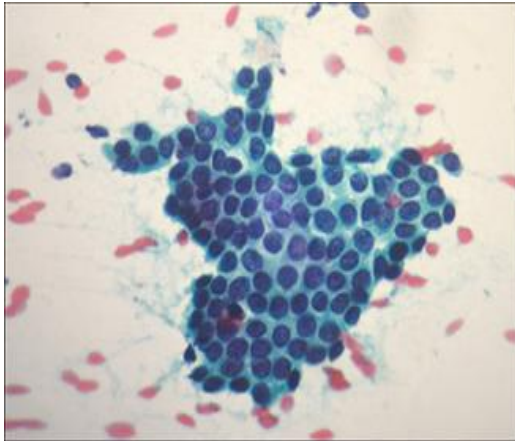


Fig. 5: Ductal carcinoma in situ.

The aspirates of the medullary carcinoma are rich in large, undifferentiated cancer cells, with irregular coarsely granular nuclei and often very large nucleoli, arranged singly and in loose clusters. Abnormal mitotic figures are sometimes conspicuous. The presence of lymphocytes is mandatory for recognition of tumor type⁽¹⁴⁾.

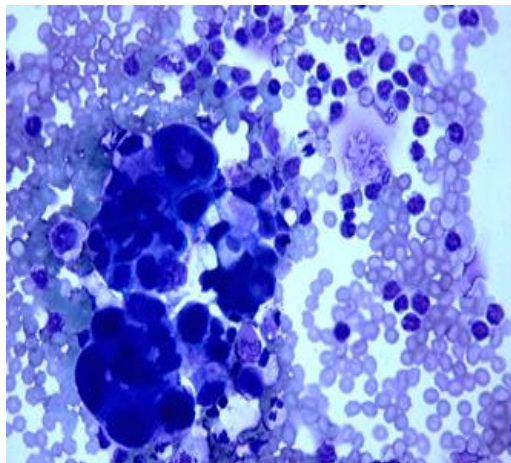


Fig. 6: Medullary carcinoma breast.

Some of Invasive Lobular Carcinoma are difficult to aspirate because there is considerable fibrosis, which results in diagnostic problems caused by scanty evidence of cancer. In most cases, a population of small, fairly monotonous cancer cells is observed, with at least some cells showing cytoplasmic vacuoles on close inspection. The cells are either dispersed or form clusters and single files. The nuclei, often granular and of similar sizes, are usually smaller than those of duct cancer. The coarse granularity of chromatin, which is often observed in duct carcinoma, is rarely observed^(15,16).

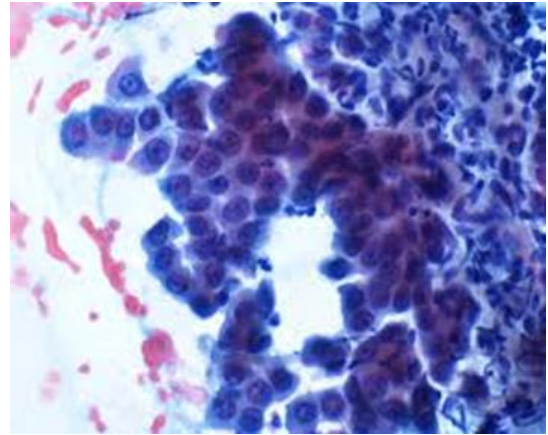


Fig. 7: Invasive lobular carcinoma-suspicious.

Conclusion

Correlation with Histopathology is very accurate and helpful for the surgeons in operative and non-operative cases. Hence we recommend correlation of FNAC and Histopathology for accurate diagnosis and treatment in our study.

References

1. Bhargava V, Jain M, Agarwal K, Thomas S, Singh S. Critical appraisal of cytological nuclear grading in carcinoma of breast and it's correlation with ER/PR expression. *J Cytol.* 2008;25:58-61.
2. Joshi A, Maimoon S. Limitations of fine needle aspiration cytology in subtyping breast malignancies-a report of three cases. *J Cytol.* 2007;24:203-6.
3. Kaufman Z, Shpitz B, Shapiro M, Rona R, Lew S, Dinbar A. Triple approach in the diagnosis of dominant breast masses: combined physical examination, mammography, and fine-needle aspiration. *J Surg Oncol.* 1994;56:254-7.
4. Nguansangiam S, Jسدapatarakul S, Tangjitgamol S. Accuracy of fine needle aspiration cytology from breast masses in Thailand. *Asian Pac J Cancer Prev.* 2009;10:623-6.
5. Kalhan S, Dubey S, Sharma S, Dudani S, Preeti, Dixit M. Significance of nuclear morphometry in cytological aspirates of breast masses. *J Cytol.* 2010;27:16-21.
6. Chaiwun B, Settakorn J, Ya-In C, Wisedmongkol W, Rangdaeng S, Thorner P. Effectiveness of fine-needle aspiration cytology of breast: analysis of 2,375 cases from northern Thailand. *Diagn Cytopathol.* 2002;26:201-5.
7. Kamphausen BH, Toellner T, Ruschenburg I. The value of ultra-sound-guided fine-needle aspiration cytology of the breast: 354 cases with cytohistological correlation. *Anticancer Res.* 2003;23:3009-13.
8. Kuo YL, Chang TW. Can concurrent core biopsy and fine needle aspiration biopsy improve the false negative rate of sonographically detectable breast lesions? *BMC Cancer.* 2010;10:371.
9. Nggada HA, Tahir MB, Musa AB, Gali BM, Mayun AA, Pindiga UH, et al. Correlation between histopathologic and fine needle aspiration cytology diagnosis of palpable breast lesions: a five-year review. *Afr J Med Med Sci.* 2007;36:295-8.

10. Saad RS, Silverman JF. Breast. In: Bibbo M, editor. *Comprehensive cytopathology*. 3rd ed. China: Elsevier Saunders; 2009. pp. 713-72.
11. Masood S. Cytomorphology of fibrocystic change, high-risk proliferative breast disease, and premalignant breast lesions. *Clin Lab Med*. 2005;25:713-31.
12. Masood S, Frykberg ER, McLellan GL, Scalapino MC, Mitchum DG, Bullard JB. Prospective evaluation of radiologically directed fine-needle aspiration biopsy of nonpalpable breast lesions. *Cancer*. 1990;66:1480-7.
13. Sneige N, White VA, Katz RL, Troncoso P, Libshitz HI, Hortobagyi GN. Ductal carcinoma in-situ of the breast: fine needle aspiration cytology of 12 cases. *Diagn Cytopathol*. 1989;5:371-7.
14. Howell LP, Lin-Chang L. Cytomorphology of common malignant tumors of the breast. *Clin Lab Med*. 2005;25:733-60.
15. Kini H, Pai R, Rau AR, Lobo FD, Augustine AJ, Ramesh BS. Pleomorphic lobular carcinoma of the breast-a diagnostic dilemma. *J Cytol*. 2007;24:193-5.
16. Abhijit HD, Ashok GS, Prakash MR, Basavaraj GV, Shrishail MC. Accuracy of intra-operative imprint smears in breast tumors: A study of 40 cases with review of literature. *Ind J Surg*. 2006;68:302-5.