Original Research Paper

Pathology

CYTOLOGICAL EVALUATION OF MALIGNANT BREAST LESIONS AND ITS CORRELATION WITH HISTOPATHOLOGY

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ABSTRACT
Background: Breast carcinoma is the most common and deadly malignancy of women globally. FNAC is an OPD procedure that is easy to perform, accurate, reproducible and cheap. It is a part of triple test to diagnose the breast lump. Its accuracy in many situations can approach that of histopathology in providing an unequivocal diagnosis.
Methods: This is a retrospective study done in the Department of Pathology of Siddhartha Medical College, Vijayawada. The study was conducted for a period of 2 years from January 2018 to December 2019. There were a total 340 FNAC cases. Out of 340 cases of breast FNACs evaluated, histopathological correlations were available for 271 cases. Among 340 cases,32 case has insufficient material, 198 cases were benign, 18 cases were diagnosed as atypia probably benign ,2 cases were diagnosed as suspicious of malignancy and 89 cases were diagnosed as malignant.
Results: Out of 89 malignant cases, majority of the cases were in the age group of 51 to 60 years followed by 41 to 50 years.
Conclusion : Fine needle aspiration cytology is a highly sensitive and specific technique for diagnosis of malignant breast lesions.

KEYWORDS : Fine Needle Aspiration Cytology, Breast Cancer, Infiltrating Duct Carcinoma

INTRODUCTION

Breast cancer is now the most common cancer in Indian women, having recently overtaken cervical cancer.[1]. Incidence of breast cancer increases with age like that of other epithelial tumours. Patients with breast cancer will have very good prognosis if detected at an early stage.[2] The investigation of palpable breast lumps in successful breast programs utilizes a multidisciplinary approach that centers around the 'triple test', analyzing clinical and radiologic findings in conjunction with the pathologic features to diagnose the lesion and determine the best treatment plan for the patient[3] The use of fine-needle aspiration cytology (FNAC) as part of this triple test is increasing. Fine needle aspiration cytology is done to initially categorize the disease and to provide differential diagnosis. Conventional surgical histopathology is the definitive diagnostic test in any lesions. This study is intended to subjectively evaluate the malignant lesions in breast using FNAC with histopathological correlation to assess the diagnostic accuracy.

METHODS

In the present study, fine needle aspiration was done on the palpable breast lumps, referred from Government General Hospital, Vijayawada, Department of Pathology. The study was conducted for a period of 2 years from January 2018 to December 2019. A total of 340 cases were included in this study. Consent was taken for performing FNAC in every case. Findings about age, site, size, consistency, mobility, ulceration, pain, discharge, duration of lump, fixation to skin etc. were noted. Ultrasonography findings were noted wherever performed.

Biopsies sent from surgical department were grossed, processed and wax blocks prepared.

FNAC findings have been concluded with different categories of diagnosis according to IAC.IAC has established a process to produce comprehensive and standardized approach to FNAC reporting. They have categorized the breast lesion into C1 to C5[4] (C-Code).

C1: Insufficient material
C2: Benign
C3: Atypical probably benign

C4: Suspicious, probably in situ or invasive carcinoma
C5: Malignant

All C5 cases were graded cytologically using Robinson's criteria, compared with Elston and Ellis modified Bloom–Richardson grading system.

INCLUSION CRITERIA

All patients presenting to the Department of Pathology, Siddhartha Medical College, Vijayawada, during the study period with breast lesions, irrespective of age and sex, are included in the study.

EXCLUSION CRITERIA

Uncooperative patients, repeat FNAC patients, patients with diagnosed breast malignancy on treatment and patients with recurrent breast malignancy were excluded from the study.

RESULTS

The study was conducted for a period of 2 years from January 2018 to December 2019. There were a total 340 FNAC cases.

Out of the total 340 cases, the final cytological report was given as per the IAC coding system and had C1 in 32 (9.4%) case,C2 in 198 (58.2%) cases, C3 in 18 (5.2%) cases,C4 in 04 (0.58%) cases, and C5 in 89 (26.1%) cases.

Table 1 showing the age distribution

Age	Frequency	Percentage
<30	2	2.24%
31-40	14	15.7%
41-50	25	28.08%
51-60	28	31.46%
61-70	16	17.9%
>70	4	4.4%

We had a wide age group patient ranging from 25 years to 90 years.(Table 1) Most of the cases (59.5%) were in age group of 4th and 5th decade, with a predominance of right sided malignant breast lesions 45 (50.5%) cases, followed by left side 43 (48.3%) cases and the bilateral 1 (1.1%) case.

In C5 lesions, histopathology follow up was available for 82 cases; histopathological and cytological correlation was done based on Robinson's criteria.

Of the 89 C5 lesions, 81 were reported as Infiltrating Ductal Carcinoma, Not Otherwise Specified (NOS) type(Figure 1), 5 cases were reported as mucinous carcinoma(Figure 2) breast on cytology, one case was reported as apocrine carcinoma (Figure 3)breast, and 2 cases as papillary carcinoma breast. (Table 2)

Table 2 Cytological distribution of C5 lesions

Diagnosis	No. of cases	Percentage
C5-Invasive Duct cell carcinoma	81	91 %
C5-Apocrine carcinoma	1	1.12%
C5-Mucinous carcinoma	5	5.6%
C5-Papillary carcinoma	2	2.24%

Out of 89 cases, follow up was available for 82 cases in which 77 cases were malignant on histopathology and 5 cases turned out to be benign. One case diagnosed as Mucinous carcinoma in cytology was given as mature lipoma in histopathology. Trucut biopsy of one case diagnosed as duct cell carcinoma showed only fibrous tissue in histopathology. Three cases given as invasive Duct Cell Carcinoma in cytology turned out to be fibrocystic disease with adenosis in histopathology (Table 3).

The concordance of cytohistological grading is 93%. Deep seated lesions, pauci-cellularity of smear, and technical error may be the cause of this discordance.

The overall sensitivity of FNAC in our study is 100% and positive predictive value is 93.9%.

DISCUSSION

Breast cancer is the most common female cancer worldwide. It accounts for nearly a quarter (25%) of all cancers with an estimated 1.5 lakh new cancer cases diagnosed in 2016.Women from less developed regions (8,83,000 cases)have slightly a greater number of cases compared to more developed (7,94,000) regions.[1,5] In India, although age adjusted incidence rate of breast cancer is lower (25.8 per100 000) than United Kingdom (95 per 100 000), mortality is on par (12.7 vs 17.1 per 100 000) with United Kingdom.[5,6].

Many countries have breast cancer screening programs aimed at detecting early disease in asymptomatic women. FNAC occupied a major role in the "Triple test."[7]

FNAC of breast lumps is an accepted and established method for determining the benign or malignant nature of various breast lumps with a high degree of accuracy [8,9]. Considering patients' comfort, lack of requirement of anesthesia, rapid analysis and reporting, and an absence of false positive results makes FNAC an ideal initial diagnostic modality in breast lesions.

FNAC of the breast can reduce the number of open breast biopsies.[10]

Our study included 89 cases with palpable breast lumps in which cytomorphological features of malignant breast lesions were studied in detail and the cytological results were subsequently compared with that of histopathology in 82 available cases.

In C5 category, 89 (26.1%) cases were reported as malignant lesions presenting most commonly in age group of 51-60 years, among which 81 (91%) cases were ductal carcinoma (most common).

Sunita et al[11] reported 37.1% cases of C5 category which is similar to our study. Waghmare RS et al[12] (31.5%) and Wang HH et al[13] also observed similar results. S. Sideguard et al[14] reported 17% cases as malignant lesions , Panwar, et al[15] had 8.4% cases of C5 category and Modi et al. [16] 16.7% which is less than that of our study. (Table 4)

In our study, a 93.6% cyto-histopathological correlation was observed for malignant lesions. Sahil I. Panjvani et al. [17] (100%) and O'Neil S et al., [18] (99.25%) also observed similar results.

Table 3: Cyto-Histopathological correlation

HPE diagnosis / Cytological diagnosis	Benign	Invasive DCC	Papillary carcinoma	Mucinous carcinoma	Apocrine carcinoma	Invasive lobular
Invasive DCC	4	67	2	0	0	1
Papillary carcinoma	0	0	2	0	0	0
Mucinous carcinoma	1	0	0	4	0	0
Apocrine carcinoma	0	0	0	0	1	0

Table 4 :Comparison between the various studies

Studies	C5 lesions percentage
Panwar et al	8.4 %
Modi et al	16.7%
S.Siddegowda et al	17%
Wanghmare et al	31.5%
Sunita et al	37.1%
Present study	26.1 %
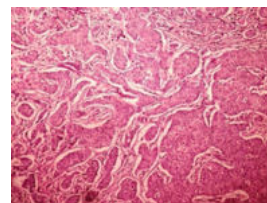
© HPE- malignant duct epithelial cells in tubules and sheets with moderate nuclear pleomorphism(100X)
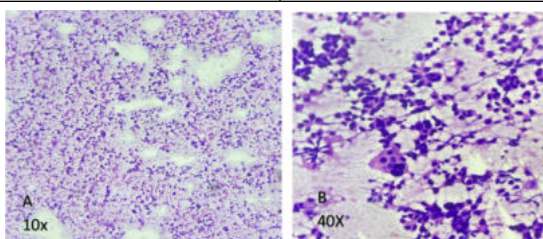

Figure 1: Ivasive DCC (a) FNAC- poorly cohesive malignant cells, single and clusters(10x) (b)malignant cells with nuclear enlargement and pleomorphism, coarse chromatin.(100x)
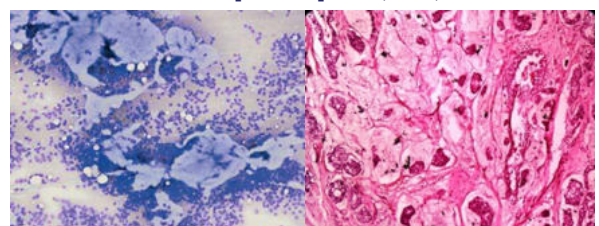

Figure 2: Mucinous arcinoma;(a)FNAC-moderately cohesive epithelial cells suspended in mucus.(10x)
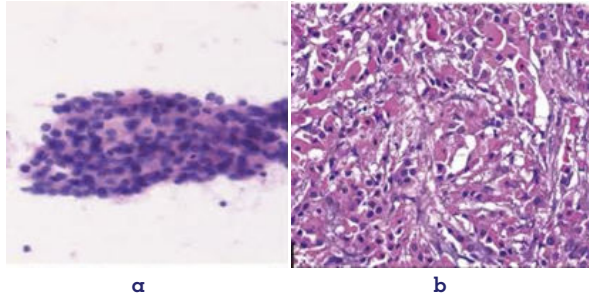(b) HPE-Tumor nests floating in pools of mucin(400x)

α   b

Figure 3:(a) FNAC- irregular cluster of malignant cells with abundant bray cytoplasm, pleomorphic nuclei, prominent nucleoli; (b)HPE- nests, sheets and cords of tumor cells with abundant granular eosinophilic cytoplasm.

CONCLUSION

FNAC is an important diagnostic adjunct in the management of patient with a breast lump. Recently FNAC popularity has grown many folds and has become a most valuable tool in the diagnosis of palpable breast masses owing to its distinct advantages of being sensitive, specific, expedient, economical and safe. Lack of local or general anesthesia makes the procedure more comfortable for the patient and the pathologist. It greatly compliments the clinical and radiological examination and permits rapid diagnosis in more than 95% of the cases.

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