Original Research Article

Cytomorphological Evaluation of Breast Lesions in Rural Tertiary Care Centre

Jayawant Mahadani and Virendra Khadse[*]

Assistant Professor, Department of Pathology, Shri Vasantrao Naik Government Medical College, Yavatmal, Maharashtra, India- 445001

QR Code

*Correspondence Info:
Dr. Virendra Khadse,
Assistant Professor,
Department of Pathology,
Shri Vasantrao Naik Government Medical College,
Yavatmal, Maharashtra, India- 445001

Abstract

Background and Objectives: Breast cancer is the leading cause of morbidity and mortality worldwide. Benign as well as malignant breast lesions are quite common in Indian population. It is the second most common cancer site after cancer cervix. The present research was undertaken to study the cytomorphological patterns of various breast lesions diagnosed on Fine Needle Aspiration cytology.

Method: This study was carried out on 211 patients who presented with palpable lumps in breast in the Department of Pathology, Shri Vasantrao Naik Government Medical College, Yavatmal, Maharashtra, from Jan 2017 to Jan 2018 and were subjected to an FNAC procedure after obtaining a detailed history and conducting a general physical and local examination. Cytological diagnosis was made and histopathological correlation was made, wherever available.

Result: Total 211 cases were studied, the incidence of breast lesions was maximum in the age ranged from 21 to 30 years [121 (57.34%)]. There were 98.57% female patients. Of the total cases, 177 were in the benign category and 34 belonged to the malignant category. Among 211 cases, 107 cases (50.71%) were available for histopathological examination. Most commonly encountered benign breast lesion was fibroadenoma (87/177; 49.15%). Most commonly encountered malignant breast lesion was invasive ductal carcinoma (IDC) [32/34; 94.11%].

Conclusion: From present study it is evident that benign breast lesions are common than malignant lesions. The simplicity, rapidity, lack of morbidity, and cost effectiveness of FNAC makes it the most valuable tool in the evaluation of both neoplastic and non-neoplastic breast lesions.

Keywords: Breast cancer, Benign, Malignancy, Cytomorphology, Fine Needle Aspiration Cytology, Fibroadenoma, Neoplastic.

1. Introduction

Breast lesions are a heterogeneous group of disorders ranging from inflammatory lesions to invasive cancers [1]. It is the second most common cancer site after cancer cervix in Indian females, comprising 22.2% of all new cancer diagnoses and 17.2% of all cancer deaths [2]. Clinically, palpable lump is the commonest presentation followed by nipple discharge and pain along with other symptoms [3]. However, many of the signs and symptoms encountered in various breast diseases are nonspecific and require further evaluation by means of imaging and sometimes followed by biopsy study for definitive diagnosis [4].

Benign lesions of the breast are usually seen in the reproductive age, these are thought to be hormone induced and there is drastic fall in incidence, after menopause due to absence of ovarian stimulation [5,6]. Benign Breast Disease (BBD) deserves attention because of their high incidence, their impact on women's life and due to cancerous potential of some histological types. BBD are more common than malignant ones [7,8]. However, it is relatively common in younger population and the incidence rises during the second decade of life and peaks in the fourth and fifth decades. In contrast, the malignant diseases are more common after menopause [4].

The management of breast disease needs a deliberate, synchronized diagnostic and treatment strategy. Fine-needle aspiration cytology (FNAC) is an important diagnostic tool for the preoperative diagnosis of palpable and non-palpable breast lesions [9]. The procedure is safe, reliable and time saving outdoor procedure with little discomfort to the patient. FNAC is not only useful in diagnosis and further planning of treatment without need for biopsy, but also helpful in prognostication of the tumor factors such as nuclear grading, mitotic index, hormone receptor status and DNA contents. The slides can be prepared by cytospin method or thin prep method [10]. Hence, the current study was carried out with an objective to study the cytomorphological patterns of various breast lesions diagnosed on FNAC in a rural Tertiary Care Centre.

2. Materials and Methods

The present study was conducted in the Department of Pathology, Shri Vasantrao Naik Government Medical College, Yavatmal, Maharashtra which is a rural Tertiary Care Hospital catering rural population of Yavatmal district. A total of 211 cases of palpable breast lumps referred to the cytology section of pathology department for FNAC were included in the study during the period from Jan 2017 to Jan 2018.

A detailed clinical history was taken and a general physical and local examination was done. After diagnosing clinically, FNAC under ultrasonography guidance was undertaken wherever necessary. The final diagnosis and clinical data were recorded and correlated with special reference to age, site of lesion, chief complaints, clinical investigations, and metastasis, if any.

3. Observations and Results

During the one year of study period, a total of 211 FNAC's of breast were done. Age included in this study ranged from 11 years to more than 50 years. Majority of cases i.e. 121 (57.34%) were among age 21-30 years. Least commonly affected age was more than 50 years (3.79%). Among all cases, 3 (1.42%) were male and 208 (98.57%) were female patients [Table 1].

Table 1: Age Wise Distribution of Cases

Age in Years	No. of Cases	Percentage (%)
11-20	22	10.42%
21-30	121	57.34%
31-40	49	23.22%
41-50	11	5.21%
>50	8	3.79%
Total	211	100%

The right breast was affected in 112 (53.08%) cases, left breast was affected in 67 (31.75%) cases and both breasts were affected in 32 (15.16%) cases. The majority of breast lumps 126 (59.71%), were located in the upper outer quadrant followed by lower inner quadrant, 45

(21.32%) cases, followed by lower outer quadrant, 24 (11.37%) cases and the least number of cases was in the upper inner quadrant, 16 (7.58%).

The presenting symptoms of the patients were shown in table 2. Most of the cases (69.66%) presented with breast lumps that were mobile and painless.

Table 2: Clinical presentation

Clinical presentation	No. of Cases	Percentage
Breast lump, mobile, painless	147	69.66%
Breast lump with pain	45	21.32%
Breast lump with pain and nipple discharge	12	5.68%
Nipple discharge	7	3.31%
Total	211	100%

Of the total cases, 177 cases were in the benign category, and distribution of benign breast lesions were shown in table 3 while 34 cases belonged to the malignant category and the distributions were shown in table 4. Most commonly encountered benign breast lesion was fibroadenoma (87/177; 49.15%). Most commonly encountered malignant breast lesion was invasive ductal carcinoma (IDC) [32/34; 94.11%].

Table 3: Distribution of benign breast lesions

Clinical presentation		No. of Cases	Percentage
A) Benign breast lesions		39	22.03%
Fibrocystic disease		09	5.08%
Benign proliferative breast diseases (BPBD)	With atypia	11	6.21%
	Without atypia	08	4.51%
	With granulomatous reaction/Mastitis	07	3.95%
Galactocele		05	2.82%%
Cystic lesions		01	0.56%
Lactational changes		03	1.69%
Gynecomastia		03	1.69%
Intraductal Papilloma		01	0.56%
B) Fibroepithelial lesions			
Fibroadenoma (FA)	84		
FA with hyperplasia of the endometrial stroma	01	87	49.15%
FA with pleomorphic adenoma with extensive cystic degeneration	01		
Cellular FA	01		
Benign/Low-grade phyllodes		03	1.69%
Total		177	100%

Table 4: Distribution of malignant lesions

Malignancy	No. of Cases		Percentage
A) Ductal Malignancy	29		
Pleomorphic Ductal Malignancy	01		
Ductal Malignancy with Axillary Metastasis	01	32	94.11%
Ductal Malignancy with Inflammation	01		
B) Invasive Lobular Carcinoma		02	5.88%
Total		34	

Only 107 cases underwent a surgical procedure and could be correlated with histopathological examination (HPE) as shown in table 5.

Table 5: Cyto-histopathological correlation of 107 cases of breast lesions of the present study

Cytological diagnosis	Histopathological diagnosis		Total
	Malignant	**Benign**	
Malignant (31)	27 (a: true positive)	04 (b: false positive)	31
Benign (76)	04 (c: false negative)	72 (d: true negative)	76
Total (107)	31	76	107

4. Discussion

Breast cancer incidents are very commonly found and one among many clinical problems faced by Indians. Even though there has been a little success in preventing this, we can significantly reduce mortality and morbidity by in-time detection of the incidence of cancer. FNAC for breast lesion diagnosis is a very accurate and established procedure. Mostly patients are in a state of anxiety. It has been reported that only 0.0045% of chances are there for tumor to be transferred along the needle track by FNA procedure [11]. The present study included the FNAC material of 211 breast lump cases in which the cytomorphological features were studied in detail, followed by histopathology in 107 cases. The age of the patients ranged from 11 to >50 years with majority of cases in the 21–30 year age group. A study conducted by Koorapati *et al* [4] showed similar results with most affected age group being 21-30 years. Also our findings compared well with the observations of the other authors [12-14]. Males constituted only 1.42% cases in our study. In the study by Deshpande *et al*, males contributed to only 1% though their study was on neoplastic breast lesions [15]. Also, in the study by Danadapat *et al* [16], there were very few male patients. Breast lesions are uncommon in males and our findings compared well with the above authors.

In the present study, the frequency of benign lesions was higher than malignant lesions, as is seen in previous studies [17,18]. However malignant breast lesions show frequency different in the current study when compared to other studies [19,20]. This can be due to decreased health awareness in a rural population which does not enforce them to seek medical attention but ignore it when they present with any vague symptoms. In majority of the cases, mass was located in the right breast in the upper outer quadrant and least in the upper inner quadrant. This was in accordance with other studies in literature [4,21]. In 208 cases, the aspirates were adequate for diagnosis, and 3 cases were inadequate for interpretation where no diagnosis was made. Thus the overall accuracy of cytology in the diagnosis of breast lesions was reported to be 90 to 100%. Comparative analysis of present study with other studies [20,22,23]. Nguansangiam *et al* [24] found 4.2% of unsatisfactory smears that needed further repeat aspiration or core/incisional biopsy for analysis. Unsatisfactory samples can be due to insufficient experience of the pathologist, radiologist, or clinician who performed FNA or due to the nature of lesion itself.

In the present series, fibroadenoma (49.15%) followed by benign proliferative breast diseases (BPBD) (12.32%), fibrocystic disease (5.08%) and granulomatous reaction/Mastitis (3.95%) were the most common breast lesions on cytology, which is in agreement with previous studies [25,26]. But by and large the diagnosis of fibroadenoma on clinical examination can be made easily based on the clinical history and examination of the patient. Total 34 malignant lesions were seen in our study, while in study by Sankaye and Dongre [25], 65 cases were seen. Ductal malignancy was most common with 94.11% cases in our study and 95.91% in study done by Domínguez *et al* [26]. Invasive lobular carcinoma was seen in only 2 (5.88%) cases in this study, while it was second common tumor in study by Domínguez *et al* with 4 (2.72%) cases [26].

Of the total 211 breast lesions cases, the histopathology follow-up of only 107 cases was available as only these patients underwent surgery for breast cancer in this institute. Fibroadenoma diagnosed cytologically were 87/211. On histopathological examination, 84 cases were confirmed as fibroadenoma while remaining one cases of cytologically diagnosed fibroadenoma (FA) was reported as FA with hyperplasia of the endometrial stroma on HPE. Another 2 cases reported as fibrodenoma on cytology examination was found as pleomorphic adenoma with extensive cystic degeneration and one case reported as cellular FA on HPE, thus giving a false-negative result (FNR). Another FNR was 4 cases of benign phyllodes tumor on cytology examination, which was finally diagnosed as invasive ductal carcinoma (Table 5).

5. Conclusion

From present study it is evident that benign breast lesions are common than malignant lesions. FNAC differentiates between benign and malignant condition preoperatively, so reduces patient's anxiety and also helps the surgeon to plan the surgery. Thus FNAC has reduced the rate of open biopsies and surgical workload. It is the most valuable tool in the evaluation of both neoplastic and non-neoplastic breast lesions. However, some difficulties and limitations need to be mentioned about the procedure, viz. both false-negative and false-positive results can occur, which can be avoided by experience and expertise of cytopathologist. The overlapping features of different lesions can also cause cytodiagnostic errors. So it is concluded that FNAC should be used as a routine diagnostic procedure due to its cost effectiveness and quick results, thus maximizing the availability of effective health care to patients with breast lesions.

Reference

[1]. Guray M, Sahin A. Benign Breast Diseases: Classification, Diagnosis and Management. *Oncologist*. 2006; 11(5): 435-49.

[2]. Ferlay JBF, Pisani P, Parkin DM. GLOBOCAN 2000: Cancer Incidence, Mortality and Prevalence Worldwide, version 1.0. 2001. Geneva: WHO.

[3]. Dixon J M, Mansel RE.ABC of breast diseases. Symptoms assessment and guidelines for referral. *BMJ*. 1994; 309(6956):722-26.

[4]. Koorapati R, Bookya K. A study on clinical and pathological correlation of benign breast lesions. *Int Surg J* 2017; 4:2700-5.

[5]. Santen RJ, Mansel R. Benign breast disorders. *N Engl J Med*. 2005; 353:275-85.

[6]. Douglas J, Merchant MD. Benign Breast Diseases. *Obst Gynaecol Clinics of North America*. 2002; 29(1): 1-2.

[7]. Haagensen CD. The basis forthe histologic grading of carcinoma of the breast. *Amer. Cancer* 19 (1933), 235. Diseases of the breast. WB Saunders Co., Philadelphia and London: 1956.

[8]. Goehring C, Morabia A. Epidemiology of Benign Breast Disease, with Special Attention to Histologic Types. *Epidemiol Rev*.1997; 19(2):310-22.

[9]. Singh P, Chaudhry M, Nauhria S, Rao D. Cytomorphological patterns of breast lesions diagnosed on fine-needle aspiration cytology in a tertiary care hospital. *Int J Med Sci Public Health* 2015; 4:674-679.

[10]. Meena SP, Hemrajani DK, Joshi N. A comparative and evaluative study of cytological and histological grading system profile in malignant neoplasm of breast — An important prognostic factor. *Indian J Pathol Microbiol* 2006; 49:199-202.

[11]. Hadded FS. Re: Risk Factors for perineal seeding of prostate cancer after needle biopsy. *J Urol*. 1990; 143:587–588.

[12]. Ilaiah M, Purnaiah M, Pasha M. Evaluation of Benign Breast Diseases with Clinico, Pathological and Radiological Correlation. *Indian J Appl Res.* 2015; 5(11).

[13]. Mallikarjuna, Maralihalli SS. Clinico-pathological study of benign breast disease. *Indian J Basic Appl Med Res*. 2015:4(2): 39-46.

[14]. Bhargava GS, Gupta A, Grover A, Ded KS. Benign breast disorders: rural Punjab population study compared with urban population studies. *Int Surg J.* 2015; 2(4):629-33.

[15]. Kumar AD, Jayashankar E, Shailaja P, Ramamurti T. Expression of Estrogen, Progesterone and HER2/ neu Receptors in Breast Carcinoma- Study in a Tertiary Care Hospital. *J Evolut Med Dent Sci*. 2015; 4(58):10170-7.

[16]. Dandapat MC, Panda BK. Fine needle aspiration as a primary adjunct in the diagnosis of palpable breast lumps. *J Indian MA*. 1986; 84(1):3.

[17]. Mulka A, Kotasthane VD *et al*. Correlation of Histopathological Study of Breast Lesions with Cytology and Mammography as a Measure of Internal Quality and Diagnostic Accuracy. *Annals of Pathology and Laboratory Medicine* 2017; 4(4): A-398-A-402.

[18]. Rasheed A, Sharma S, Rasool M, Bashir S, Hafiz A, Bashir N. A three year study of breast lesions in women aged 15- 70 years in a tertiary care hospital. *Sch J App Med Sci.* 2014; 2(IB):166-68.

[19]. Chandanwale SS, Gupta K, Dharwadkar AA, Pal S, Buch AC, Mishra N. Pattern of palpable breast lesions on fine needle aspiration: A retrospective analysis of 902 cases. *Journal of Mid-Life Health*. 2014; 5(4):186-191.

[20]. Vijayabharathi, A. Bhagyalakshmi, J. Rajendra Prasad, S. Satish Kumar. Prospective Study of CYTO Histopathological Correlation of Breast Lesions. *Journal of Evidence based Medicine and Healthcare*. June 15, 2015; 2 (24):3577-3586.

[21]. Chalya PL, Manyama M, Rambau PF, Kapesa A, Ngallaba SE, Masalu N *et al*. Clinicopathological pattern of benign breast diseases among female patients at a tertiary health institution in Tanzania. *Tanzania J Health Res*. 2016; 18(1).

[22]. Pandey A, Mishra K.B, Gaur B.S, Singh R. The diagnostic utility of FNAC in palpable lesions of breast at a tertiary care centre. *Int J Med Res Rev* 2017; 5(03): 338-345.

[23]. Shanmugasamy K *et al*. Cyto-histological correlation of breast lump- as a part of internal quality control. Indian *Journal of Pathology and Oncology* 2016; 3(2): 328-335.

[24]. Nguansangiam S, Jesdapatarakul S, Tangjitgamol S. Accuracy of fine needle aspiration cytology from breast masses in Thailand. *Asian Pac J Cancer Prev* 2009; 10(4):623–6.

[25]. Sankaye SB, Dongre SD. Cytological study of palpable breast lumps presenting in an Indian rural setup. *Indian J Med Paediatr Oncol* 2014; 35:159-64.

[26]. Domínguez F, Riera JR, Tojo S, Junco P. Fine needle aspiration of breast masses. An analysis of 1,398 patients in a community hospital. *Acta Cytol* 1997; 41:341-7.