

Original Research Article


Cytohistological Correlation of Breast Tumors - A case study

Priyanka Poonam^{1*}, Preety Saha²

¹Tutor, Department of Pathology, Patna Medical College, Patna, Bihar, India

²Tutor, Department of Pathology, Patna Medical College, Patna, Bihar, India

*Corresponding author email: ppdoc83@gmail.com

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Abstract

Generally patients with breast tumors complain of lump in the breast which may be painful or painless and may be associated with nipple discharge or not. Benign tumors of the breast are common among younger age group <30 years. But the chances of malignancy increases with increasing age. Most of the cases of breast cancer are found in age group >50 years. FNAC forms the initial diagnostic method in patients with breast lump. A total of 250 patients with different breast lesions attended cytology section of our Pathology department for FNAC. Out of which 197 cases came for histopathological correlation in the study period of 2 years from January 2016 to December 2017. Among these majority were benign tumors (114 cases) but an alarming number of 51 cases were malignant. Next in number were benign breast diseases (24 cases). There was one case each of ductal papilloma, gynaecomastia. The commonest benign breast tumors were fibroadenoma whereas the commonest malignant tumors were infiltrating ductal carcinoma. There was one case each of lobular carcinoma in situ, infiltrating lobular carcinoma, medullary carcinoma, ductal carcinoma in male breast, inflammatory carcinoma, sarcoma breast. Hereby, we have analyzed different types of breast lesions in different age groups based on cytological evaluation followed by its histopathological confirmation.

Key words

Fibroadenoma, Infiltrating ductal carcinoma, Fibrocystic disease.

Abbreviations used

FNAC-Fine needle aspiration cytology, HRT-hormone replacement therapy, OCPs-oral contraceptive pills, USG-ultrasonography, MRI-Magnetic resonance imaging, IHC-immunohistochemistry.

Introduction

Most of the benign tumors of breast mostly fibroadenomas occur in reproductive age group <30years of age [1]. 77% of cases of cancer of breast occurs in females >50years of age [1]. The major risk factors for developing breast cancer are first degree relatives with breast carcinoma, early menarche, nulliparity, late age >30 years at first birth, and late menopause, long term use of HRT, use of oral contraceptive pills for long term after >35 years of age and exposure to ionizing radiation at adolescence [2]. Breast carcinoma accounts for 10% of all the breast lesions [3]. FNAC of breast lump is an important part of tripple assessment (clinical examination, imaging, and FNAC) of palpable lump [4]. Determination of various histological patterns of tumors is important in diagnosis, prognosis as well as treatment.

In this study, we have analyzed the frequency of various breast tumors in different age groups, presenting complains, their cytological evaluation by FNAC and confirmation by histopathology in the patients attending our tertiary referral Centre. The aim of our study was to increase awareness among clinicians of the importance of breast examination and self-breast examination by patients help in early diagnosis of cancer and many lives can be saved.

Materials and methods

This study was a prospective and descriptive study done for a period of 2 years starting from January 2016 to December 2017 at the Department of Pathology, Patna Medical College, Patna, India. All of the breast lesions were included in the study. Patients with different breast lesions supported clinically and by mammography, USG and MRI were included in the study. The diagnosis of breast tumors is based on histopathology conducted in our Pathology Department. This was a descriptive study describing the frequency of benign and malignant breast tumors in our tertiary referral centre in different age groups, their cytomorphological evaluation and

histopathological confirmation. After careful clinical examination of the breast mass for its presence, consistency and any signs suspicious of malignancy, patient was placed in comfortable position for FNAC and explained the procedure. FNAC of breast lump was done by 20-22G needle with complete aseptic precautions. Smears prepared and allowed to either air dry or were fixed immediately while the surface is still wet with 70-90% ethanol. Routinely at least 2 fixed smears were subjected to H&E and remaining smear to pap staining. The air dried smears were stained with Giemsa.

Results and Discussion

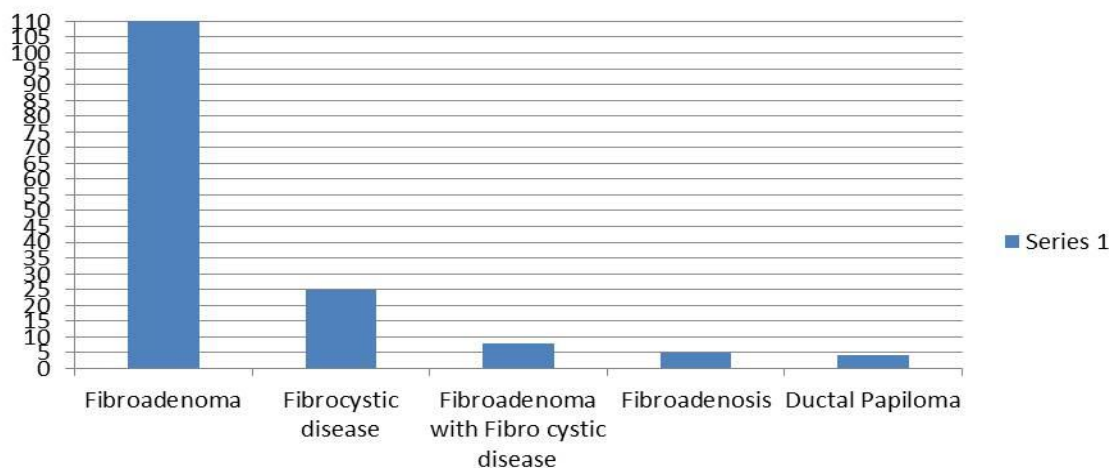
Total number of cases of breast lesions, during the study period of 2 years from January 2016-December 2017 was 250, who attended cytology section for FNAC. Out of this, we obtained a total of 197 cases for histopathological correlation. There were 146 cases of benign breast tumors and lesions (**Graph – 1**) and 51 cases were of malignant breast tumors (**Graph – 2**). The commonest benign breast tumors were fibroadenomas (114 cases), followed by benign breast disease or fibrocystic disease of breast (24 cases), 5 cases of fibroadenoma with fibrocystic disease, 3 cases of fibroadenosis, 1 case of ductal papilloma, 2 cases of giant fibroadenoma were also reported. The commonest malignant tumors were infiltrating ductal carcinoma (**Figure – 5**) of breast (39 cases), out of which 22 cases were reported with mets to axillary lymph nodes and 17 cases without mets. 6 cases of phylloides tumor and each of lobular carcinoma in situ, lobular carcinoma with mets to axillary lymph nodes, sarcoma breast, inflammatory carcinoma, mucinous carcinoma (**Figure – 6**), male breast cancer (**Figure – 7**) Gross appearance of ductal invasive carcinoma of breast, white in appearance with central necrosis in block. (**Figure – 8**), FNAC smears of ductal carcinoma of breast (10X) tumor cells were present in dyscohesive clusters as well as singly, Absence of borewal nuclei (**Figure – 9**) were also reported.

In our study period of 2 years, the commonest presenting complaint of patients with benign breast tumors were painless, firm, discrete, mobile breast lump in 109 cases. Few cases presented with painful lumpiness of breast (29 cases). The most common complain of patients with benign breast disease are pain, lumpiness or lump [1]. Patients with malignant breast tumors complained of painless hard lump of the breast with enlarged axillary lymph nodes in 22 cases and 17 cases without mets, either fixed to the chest wall or skin, along with or without serous or blood mixed nipple discharge. Females not undergoing mammography, either younger or older almost always present as palpable mass in carcinoma breast [1]. In our study, most of the cases of fibroadenomas presented in younger age group between (15-40 years), fibrocystic disease of breast between (20-40 years) age group. Phylloides tumor between (20-40 years), carcinoma breast (>35-60 years). Fibroadenoma (Figure - 1, 2) was a very common benign breast lesion occurring between (20-35 years) age group and fibrocystic disease occur between (25-

45years) [2]. The median age at the time of diagnosis of phylloides tumor (Figure - 3, 4) was 45 years [2]. 77% of the cases of breast cancer occur in women over 50 years of age [1]. Mammography identifies cancer in 75% between 40-49 years and its reliability increases with age [3]. It is indicated in older and high risk women prior to HRT and in patients with breast lump [3]. USG is useful in all age groups especially <35 years when mammography is unreliable [3]. MRI gives the most accurate measurement of the tumor size and helps in staging [3]. Our findings were well correlated with Tiwari, et al. (2007) that benign cases were the most common in (20-40 years) age and malignant cases in (40-60 years age group) [4]. FNAC of breast lump helps in diagnosis of simple cysts, confirmation of inoperable, locally advanced cancer, preoperative confirmation of clinically suspected cancer as a guide to clinical management and obtain tumor cells for hormone receptor studies, DNA analysis, IHC, cell kinetics and molecular studies [5].

Graph - 1: Frequency of various histological types of benign breast tumors.

Frequency of various Histological types of benign breast tumours



Most of the benign cases like fibroadenomas were firm on palpation and yielded whitish aspirate. Fibrocystic diseases of breast yielded thin straw coloured aspirate and presented as

lumpiness of breast. Most of the malignant cases yielded hemorrhagic aspirate. Purulent aspirate in granulomatous mastitis and whitish aspirate in gynaecomastia were yielded.

Graph – 2: Frequency of various histological types of malignant breast tumors.

Frequency of various histological types of malignant breast tumours

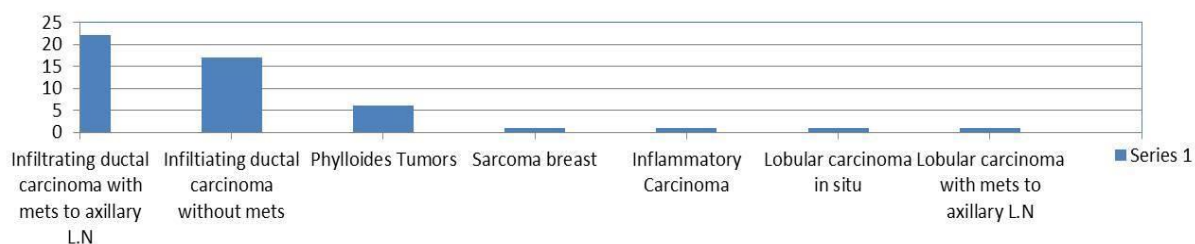


Figure - 1: Fibroadenoma-ductal epithelial cells in staghorn pattern and branching sheet. many bare oval nuclei and fibromyxoid stroma in the background.

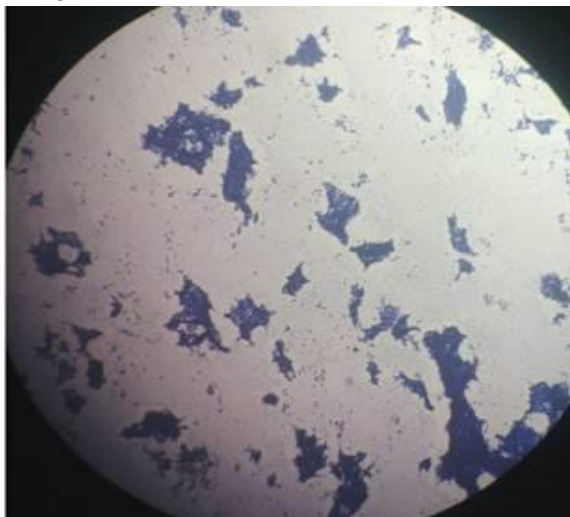


Figure – 3: Phylloides tumor, stromal fragments are larger and increased in number and hypercellular. Plump single stromal cells in the background.

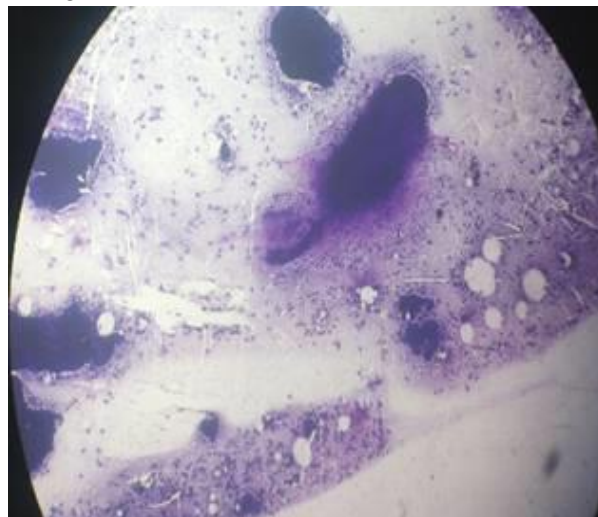


Figure – 2: HPE of Fibroadenoma pericanalicular pattern – elongated sinous ducts surrounded by myxomatous but uniformly cellular connective tissue.

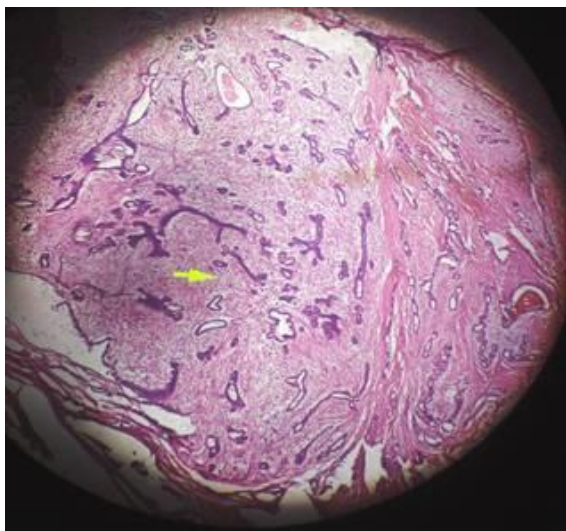


Figure – 4: HPE of Phylloides tumor shows leaf like structure showing abundant connective tissue which is highly cellular and show cytological atypia.

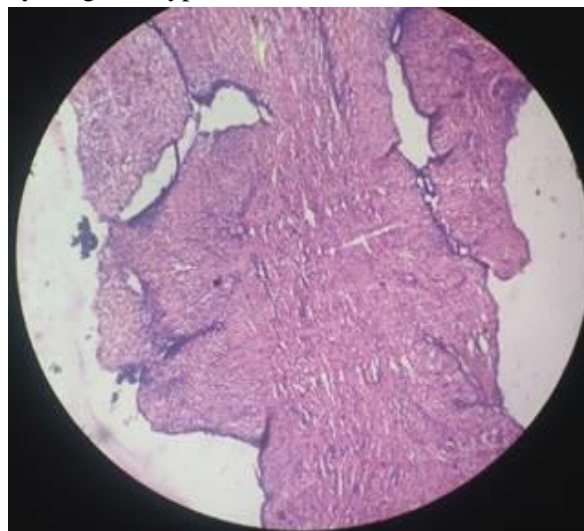


Figure – 5: Invasive ductal carcinoma NOS, Low grade-clustered and single malignant epithelial cells, mild nuclear enlargement and atypia, absence of bipolar nuclei.

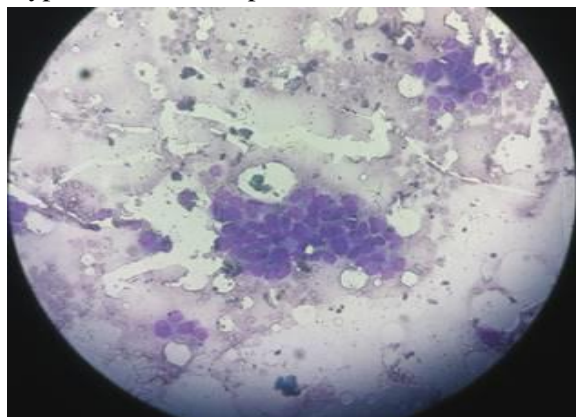


Figure – 6: Mucinous carcinoma – smear show malignant tumor cells are dispersed with abundant cytoplasm and mild pleomorphism of nuclei. Bipolar nuclei are absent. Background contains bluish violet epithelial mucin.

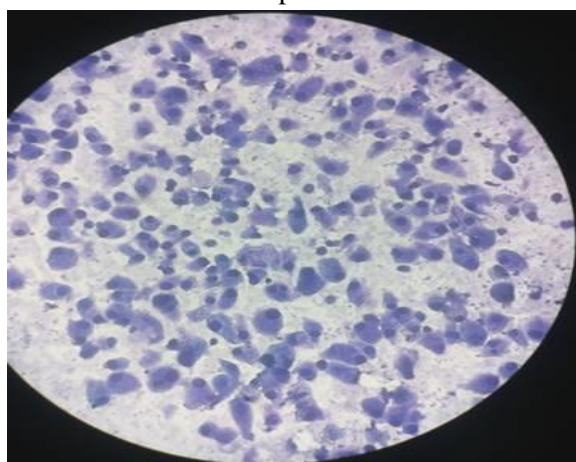


Figure – 7: Male breast carcinoma with enlarged axillary and cervical lymph nodes of right side.



Table – 1: Benign breast disorders.

ANDI (Lumpy breasts, tenderness or smooth lump)	-cyclical nodularity and mastalgia, cysts, fibroadenoma
Duct ectasia/periductal mastitis	
Pregnancy related	Galactocele, puerperal abscess
Congenital disorders	Inverted nipple, supernumerary breasts, non-breast disorders, Tietze’s disease, Sebaceous cysts and other skin condition

Table – 2: Distribution of various histological types of breast cancer.

In situ carcinoma	15-30%
ductal carcinoma in situ	80%
lobular carcinoma in situ	20%
Invasive carcinoma	70-85%
No special type	79%
Lobular carcinoma	10
Tubular carcinoma	6
Mucinous/colloid carcinoma	2
Medullary carcinoma	2
Papillary carcinoma	1
Metaplastic carcinoma	<1

Immunohistochemically, the tumor cells show reactivity for low molecular weight keratin 8, 18, 19 and epithelial membrane antigen (EMA), mammaglobin, carcinoembryonic antigen, B -27 and BCA-225 are positive in infiltrating ductal carcinoma [2]. Loss of E-cadherin expression is the hallmark of lobular carcinoma [2].

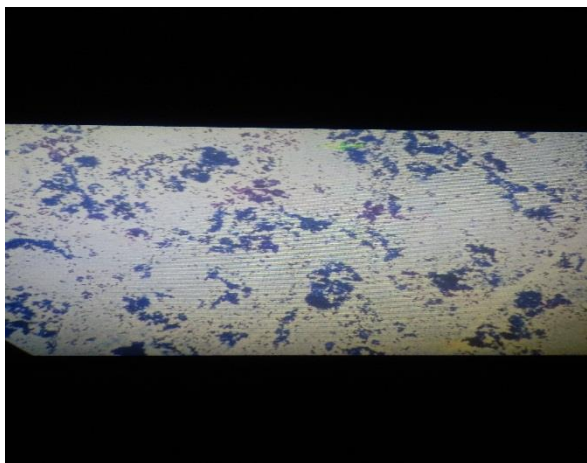
The surgical management of malignant breast tumors includes modified radical mastectomy or Patey’s mastectomy which involves removal of the whole breast, a large portion of skin, the centre of which overlies the tumor but always includes the nipple, all of fat, fascia, and lymph nodes of axilla followed by hormonal therapy with tamoxifen for estrogen receptor positive diseases [6]. Chemotherapy using 6 monthly

cycle of cyclophosphamide, methotrexate and 5 fluorouracil in patients with poor prognosis [6]. Benign breast disorders were as per **Table – 1**. Distribution of various histological types of breast cancer was as per **Table – 2**.

Figure – 8: Gross appearance of ductal invasive carcinoma of breast, white in appearance with central necrosis in block.



Figure – 9: FNAC smears of ductal carcinoma of breast (10X) tumor cells are present in dyscohesive clusters as well as singly. Absence of borewal nuclei. Tumor cells are hyperchromatic, pleomorphic and increased nuclear, cytoplasmic ratios.



Conclusion

In our study for the period of 2 years, we found that fibroadenoma were the commonest benign

tumor presented itself in younger age group between (20-40 years) whereas infiltrating ductal carcinoma were the commonest malignant tumor presented between (40-60 years) age group. Thus, screening by mammography in women >50 years for the breast tumors must be performed which may reduce mortality from breast cancer. Mammography, USG, Doppler study and MRI detect solid or cystic breast tumors. FNAC and cytological examination of the aspirate help in early diagnosis of cancer. Thus, a baseline mammography in all menopausal patients desirous of starting HRT is a desirable precaution.

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