Study of Spectrum of Clinico-pathological Presentations of Breast Diseases in a Peripheral Set-up

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ABSTRACT

Introduction: FNAC of breast lesions helps in the investigation of diseases and avoids unnecessary surgery in specific benign conditions. It is a rapid and accurate diagnostic technique. FNAC plays a major role as an important pre-operative analysis, clinical correlation and radiological investigations which are referred to as the “Triple test. Breast carcinoma is one of the most common malignant tumour in females and leading cause of death in women.

Material and Methods: A prospective study on breast aspirates was done over a 2 year period from January 2016 to December 2017. All the patients presenting with breast lesions to the Surgery OPD were subjected to an FNAC procedure after a detailed history, general physical and local examination. The slides were stained by Papanicolaou’s technique, May-Grunwald-Giemsa and Leishman-Giemsa techniques. All the lesions were categorized into 5 cytological categories.

Results: A total of 400 cases were included. There were 388 female and 12 male patients. Patients ranged from 14 to 80 years with majority between 21-40 years. The upper outer quadrant was the commonest site affected with majority affecting the right breast. In 29 cases, bilateral lesions were observed. The commonest presenting symptom was a mass in the breast.

Conclusion: FNAC is an accurate and reliable preoperative diagnostic tool for breast lesions. It is a patient friendly, easy, repeatable, quick, safe and simple diagnostic test. FNAC has a high diagnostic accuracy rates. Aspiration cytology differentiates between benign and malignant condition preoperatively, so reduce patient’s anxiety and also helps the surgeon in planning surgery.

Keywords: Breast, FNAC, Fibroadenoma, Mass

INTRODUCTION

Fine needle aspiration cytology (FNAC) of the breast can be done on both palpable as well as non-palpable lesions, the latter with the help of imaging techniques like ultrasound and mammography with stereotaxis. The purpose of FNAC of breast lesions helps in the investigation of any palpable lump and avoids unnecessary surgery in specific benign conditions.^{1,2} The advantage of FNAC is that it provides a rapid and accurate diagnosis and is diagnostic as well as and therapeutic in cystic lesions. It also permits a number of ancillary studies such as hormone receptor analysis, flowcytometry, and molecular diagnostic studies.^{2,3} With cytology identification of the subtypes of benign and malignant breast lesions is possible. This technique is also used in the detection of minimal residual disease for the purpose of planning a therapeutic protocol and eventual follow-up., FNAC alongwith clinical judgement and radiological studies play a major role in the pre-operative analysis, thus referred to as the “Triple test.”^{2,3}

Breast carcinoma is one of the commonest malignant tumour in females and the leading cause of death, with more than 10 lac cases occurring worldwide every year.⁴ In our country,

though the incidence of breast carcinomas is lower than in the West, yet it is the second most common malignant tumour in females comprising a total of 16 to 21%⁴, the first being carcinoma cervix. Evaluation of breast lumps in young females is essential to identify patients with benign proliferative lesions of the breast. Transition from normal to cancer begins by proliferation, then progresses to atypia and finally to neoplasia.^{4,5} It has been reported that a benign proliferative lesion of the breast is an important risk factor for subsequent transformation to malignancy. Karyotype and molecular alterations in benign proliferative breast lesions parallel those of breast carcinoma.⁵ Pre-malignant lesions if recognized in the young population at an early stage along with a close follow up and careful watch would make it possible to abort the development of invasive cancer.^{4,6}

In recent year there have been outstanding advances in breast cancer management leading to earlier detection of disease and the development of more effective treatment resulting in significant decline in deaths due to breast cancer and improved outcome for women living with the disease.^{1,2} Breast cancer is no longer a single entity but rather a multifaceted disease. It comprises of distinct biological subtypes with diverse natural history, presenting a varied spectrum of clinical,

pathological and molecular features with different prognostic and therapeutic implications. Significant progress is going on to search for a specific, rigorous and reproducible method of identifying successful treatment plans utilizing biological markers.

Breast cancer survival is linked to early detection, timely appropriate treatment and genetic predisposition. The prognosis of patients with carcinoma relates well to a number of clinical, pathologic and molecular features which include classical prognostic factors viz. histologic type, grade, and tumour size and lymph node metastases. Estrogen and progesterone receptors and more recently, Her-2-neu have with increasing importance influenced the management of malignancy.^{2,7,8}

The present study aimed at determining the cytological findings in palpable lesions of the breast spectrum of breast diseases in a remote area and the

MATERIAL AND METHODS

A prospective study on breast aspirates was done over a 2 year period from January 2016 to December 2017. All the patients presenting with breast lesions to the Surgery OPD were subjected to an FNAC procedure after a detailed history, general physical and local examination. The procedure of aspiration was explained to the patient and verbal consent was obtained. The patient was suitably seated for aspiration. The lump was palpated and aseptic precautions were taken. The swelling was held with one hand in a position favorable for needling. Superficial lesions were held between index finger and thumb and needle was made to enter the swelling. The aspirate was expressed on the glass slides and smears prepared two smears were immediately fixed by immersing them in a Coplin Jar of equal concentration of alcohol and ether for 30 minutes without delay. The slides were stained Papanicolaou's technique. Two slides were air dried and fixed using methanol and then stained by May-Grunwald-Giemsa and Leishman-Giemsa techniques.

All the lesions were categorized into 5 cytological categories C1 through to C5 as per NHSBSP breast reporting criteria. C1-Inadequate; C2-Benign; C3-Atypia probably benign; C4-Suspicious of malignancy; C5-Malignant. Histopathological correlation was done wherever surgery was performed. The excised mass was subjected to gross examination and the routinely stained Haematoxylin-Eosin slides were prepared and microscopically examined.

Conditions giving rise to the chronic granulomatous inflammatory condition include tuberculosis, fungal infections, sarcoidosis, Wegener's granulomatosis, foreign body giant cell reaction to implanted silicon etc. Cytological features include sheets of epithelioid cells with abundant cytoplasm, elongated nuclei, Langhan's giant cells, few lymphocytes, plasma cells and variable karyorrhectic debris. The diagnosis of tuberculosis should be confirmed by Z-N stain or culture.

RESULTS

A total of 400 cases were studied. In each case, a detailed clinical history was taken. The patients age varied from 14 to 80 years. There were 388 female patients and 12 male

patients. The age distribution in relation to sex is shown in (Table I).

Majority of the patients as seen were between 21-40 years. Out of 400 cases, in 207 cases the lesion was located in the right breast and in 164 cases it was located in the left breast. In 29 cases, bilateral lesions were observed (Table II). The lump was located in the upper outer quadrant of breast 16 in 151 cases, in the upper inner quadrant in 80 cases and in the lower outer quadrant in 59 cases. It was located in the lower inner quadrant in 65 cases and in the subareolar region in 18 cases. The mass involved both the upper outer and lower outer in 2 cases and was located in upper inner and upper outer quadrants in 9 cases. The mass was diffuse and involved all the quadrants in 16 cases (Table II).

The commonest presenting symptom was a mass in the breast. This was observed in all the cases. 105 cases in addition had associated pain, 20 cases presented with discharge from the nipple in addition to the mass and 17 cases showed evidence of ulceration also (Table III).

Out of the 400 cases, FNAC was done in all cases among which in 391 cases the aspirate was adequate for interpretation and in 9 cases the aspirate was inadequate with very scanty cellularity or only haemorrhage. There were only 225 cases for which both FNAC and biopsy was done, whose correlation has been included in the present study.

DISCUSSION

Breast lumps are one of the commonest problem presented by patients to the surgery. An early diagnosis of a breast lump is important. Criteria's including cost economy, no anaesthesia required, early reporting, no hospital stay as well as diagnostic accuracy for further management are important. FNAC has been widely used in detecting the presence or absence of cancer pre-operatively and as a guide to starting the specific treatment.¹⁴⁻²⁹

Cytology has moved gradually but unswervingly from an era of 'positive,' 'negative' and 'suspicious' diagnosis to an era of specific morphological typing of benign and malignant neoplasms as well as non-neoplastic lesions and the breast is no exception. FNA today occupies an extremely important role in preoperative evaluation of breast lesions and in most centres patient management is decided on the basis of the cytological report.¹⁵

Although prior cytological typing of breast carcinoma may have little influence on the surgical management of a case, awareness of certain types of carcinoma (e.g. tubular, mucinous, and lobular) is necessary to correctly identify these lesions. Furthermore, reconfirmation of prognostically favorable histological types is necessary to select patients for pre-operative chemotherapy.¹⁵ Cytology plays an important role in benign lesions of breast the distinction of epithelial proliferative from non-proliferative and inflammatory or granulomatous lesions. Aspirates in the latter could be stained for microorganisms or sent for microbiological culture.^{15,16}

Triple diagnosis is the combination of clinical examination, mammography and FNAC. The use of all three modalities in parallel has led to further improvement of pre-operative diagnosis.¹⁷⁻²²

The size of the needle used for FNAC is important especially

in breast lumps Fine needle may yield inadequate material whereas thick needles may cause pain or hematoma formation. All the patients in the present study were subjected to FNAC using a no. 21 needle with no patient discomfort and none of the patients complained of any untoward side effects. It helped us to perform repeat aspirations as well as bilateral aspirations.

In our study, the age ranged from 14 to 80 years. The maximum numbers of patients were found in the twenty one to forty year group followed by forty one to sixty year group. We found that there were no patients under the age of thirty-five who was detected with malignancy. Benign lesions were observed in patients of all age groups, but were more common in younger patients. In a similar study done by Hussain MT²³, the age distribution reported was 15 – 65 with majority of the 3m in the 31-40 years range. Previous studies conducted by Tiwari M²⁴ showed age distribution was between seventeen to thirty seven years with mean age as thirty two and Bajaj et al.²⁵ also showed age distribution between sixteen to sixty years.

In the present, the right breast was affected in 207 patients while the left breast was involved in 164 patients. Bilateral involvement was seen in 29 patients. In their series, Hussain MT²⁴ showed left breast involvement in 27 patients (54%) while in 23 patients the right breast was involved. No clinical significance can be attributed to this finding as it is a chance observation.

Breast lumps were more common in the upper and outer quadrant in 151 patients while the upper inner quadrant was affected in 80, the lower and outer in 59 and the lower and inner quadrant in 65. Hussain MT²⁴, and Mehrotra et al also found that upper outer quadrant was most commonly involved in both benign (50.3%) as well as malignant (52.5%) cases.²⁶

In this study, the duration of the breast lump varied from 2 to 7 months in 340 patients. In the remaining 60 cases the duration was more than 7 months. In comparison, the study by Hussain MT²³ a similar study. Early presentation by patients thus alarmed by the lumps is important considering the increase of awareness among them.

In our study we had nine aspirations which were reported as unsatisfactory bringing the inadequate sampling rate to 2.5%. Study done by Hebbar AK et al reported inadequate sampling rate as 2%.³⁵ Expertise in carrying out the procedure and also in interpreting the findings influences results. Patel J³³ reported that FNAC results were influenced by the number of needle maneuvers jabbing. He stated that more the number of to and fro of the needle more the chance of getting on adequate material. The other probable reason for unsuccessful aspiration could be because of increased fibrous tissue or cystic lesion.

The most common disease noted in our patients was fibroadenoma in 182 patients. This was followed by fibrocystic disease in 55 patients and malignancy in 76 patients. In their study on 91 patients, Tiwari M²⁴ also formed fibroadenoma as the most common pathology (39.6%). Deshpande K²⁰ also reported fibroadenoma as the most common benign breast lesion followed by fibrocystic disease. But in the study done by Bajaj P et al²⁵ acute mastitis was the commonest

lesion followed by fibrocystic disease. In our study we also found one case of myofibroblastoma which was not observed in other studies. Among the male patients we observed gynecomastia as the commonest breast lesion which was also reported by Deshpande K.²⁰

The present study showed that among the malignant breast lesions infiltrating ductal carcinoma was the commonest lesion. Same finding was observed by Hebbar AK et al³³, Deshpande K²⁰, Bhagat R.¹⁸ Tiwari M²⁴, Ariga et al.¹⁰ Among these cases we also found one case of Paget's disease of breast along with infiltrating ductal carcinoma which was not observed in other studies.

The present study showed few cases which were diagnosed as fibroadenoma on cytology but on histopathological examination two were diagnosed as phyllodes tumour, one as lobular hyperplasia and one as infiltrating ductal carcinoma. Choi Y¹⁶ suggested many causes of false negative diagnosis, the most common being interpretive error followed by needle out of focus, bloody aspiration and scanty cellularity. In our study the case which was reported as infiltrating ductal carcinoma on histopathology the cause was missing the malignant focus and hitting the area which was showing features of fibroadenoma. In case of phyllodes tumour it was the scant cellularity as well as interpretive error which lead to false negative result. So the present study is comparable to studies conducted by Choi Y¹⁶ and Bhagat R.¹⁸

Image guided aspirations is another important consideration. In smaller, deeper or impalpable lesions using ultrasonic guidance is of great importance.¹⁹ In the present study few ill-defined lesions were aspirated using guided techniques which yielded better cellularity. It is important to note that the results of the present study correlate well with those of the previous studies available.

CONCLUSION

The present study was undertaken to study the cytomorphology of various breast lesions and to correlate it with histopathology wherever a surgical excision was done and to establish FNAC as is an accurate and reliable preoperative diagnostic tool for breast lesions and to assess the prognostic role of immunohistochemical markers in malignant breast lesions.

Majority of the patients were between 21-40 year age group. All the patients presented with a mass in the breast. Majority of the masses were situated in the right breast in the upper outer quadrant.

FNAC is a patient friendly, easy, repeatable and simple diagnostic test. It is a quick and safe OPD procedure to diagnose breast lesions and can be employed at the bed side. FNAC has a high diagnostic yield, good sensitivity and a high predictive value proving that FNAC yield a definite diagnosis when compared to the final histopathology report. The high accuracy rates are important especially in malignancy which requires a great negative predictive value. Aspiration cytology differentiates between benign and malignant condition preoperatively, so reduce patient's anxiety and also helps the surgeon to plan the surgery. FNAC also gives cytological grade of malignant lesion which correlates well with the histopathological grading system.

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