EFFICACY OF FINE NEEDLE ASPIRATION CYTOLOGY IN EVALUATION OF BREAST LUMPS: A ONE YEAR STUDY

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ABSTRACT

Background: Lumps in breast have always commanded a great deal of attention because of fear of their being cancerous. Preoperative diagnosis helps in planning the correct surgical and therapeutic treatment.

Aim: This study was aimed to assess the efficacy of Fine Needle Aspiration Cytology (FNAC) in breast lump evaluation with regards to sensitivity, specificity, positive predictive value and negative predictive value.

Materials and Methods: This study was carried out on 277 breast lump cases at the Department of pathology, Dr. Hedgewar Arogya Sansthan Hospital from July 2009 to July 2010. FNAC was performed by cytopathologist with a 21 or 22G needle that was attached to a 10cc syringe. Two slides were stained with May Grünwald-Giemsa (MGG) and 2 with Papanicolaou (Pap) stain. FNAC results were compared with final histopathological diagnosis. Taking histopathology as gold standard criteria, sensitivity, specificity, positive predictive value and negative predictive value of FNAC for detection of various lesions were calculated.

Results: A total of 277 cases of FNAC of breast Lumps were obtained, out of which histopathological correlation was available in only 31 (11.19%) cases. Out of 12 histopathologically confirmed malignant cases, 8 cases were diagnosed as malignant on FNAC, two cases as suspicious for malignancy, one case as atypical hyperplasia and one as benign mammary lesion. There was not even a single case which was diagnosed as malignant on FNAC and later turned out to be benign on histopathology. Out of 31 cases where histopathology was available, in 28 cases the FNAC diagnoses correlated well with the final histopathological diagnosis. In the remaining 3 cases, one was diagnosed as benign mammary lesion and others as atypical hyperplasia on FNAC. On histopathological examination all 3 showed infiltrating ductal carcinoma. The Sensitivity, Specificity, Positive predictive value and Negative predictive value of FNAC were found to be 90.32%, 100%, 100% and 86.36% respectively.

Conclusion: FNAC is a quick, inexpensive, simple, safe and readily acceptable procedure to patient and can be performed in Out Patient Department. It helps in providing a speedy and accurate diagnosis of not only breast cancers but also the majority of benign lesions mimicking malignancy.

Key words: Breast lump, FNAC, sensitivity, specificity.

INTRODUCTION:

Breast lumps in women encompasses a spectrum of benign and malignant disorders. Benign proliferative breast disease is an extremely complex and interrelated group of proliferative disorder of the breast parenchyma, most of which are not true neoplasm but are hormonally induced hyperplastic processes. Breast cancer is the most common type of cancer in women, in the age group of 40 – 50 years. It is the second leading

cause of cancer deaths i.e about 250,000 women die of this disease every year [1]. Increase in cases of breast cancers are related to late marriage, birth of child in the later age, shorter period of breast feeding and nulliparity or low parity. Though histopathological diagnosis is a universally accepted confirmatory mode of diagnosis & follow up, fine needle aspiration cytology (FNAC) of breast lumps is an important part of triple assessment (clinical examination, imaging, and FNAC) of palpable breast lumps. Fine needle aspiration cytology (FNAC) is a relevant and important diagnostic method in the management of breast cancer. It has high sensitivity and specificity in determining the pathology of breast lumps [2,3,4,5, 6].

This study was aimed to assess the efficacy of FNAC in breast lump evaluation with regards to sensitivity, specificity, positive predictive value and negative predictive value.

MATERIALS AND METHODS

This retrospective study was carried out at the Department of pathology, Dr. Hedgewar Arogya Sansthan Hospital from July 2009 to July 2010. FNAC was performed on 277 cases by cytopathologist with a 21 or 22G needle that was attached to a 10cc syringe. The skin over the lump was completely cleaned with antiseptic solution. The palpable lesion was immobilized and the needle inserted into the lesion. Multidirectional sampling was done by to and fro movement of the needle. Negative pressure was applied during this time and released prior to removing the needle. At least 3 passes were made. The needle was taken out as some fluid /blood appeared in the hub. The sample obtained was pushed onto a glass slide and smeared. At least 4 slides were prepared. 2 slides were air-dried and 2 were fixed with 95% alcohol. These air-dried slides were stained with May Grünwald-Giemsa stain, while the alcohol-fixed slides were stained with Papanicolaou stain in the cytopathology laboratory. Unsatisfactory slides

were excluded from the study. Except for mild pain reported by some patients, no other complications were recorded. Pre-operative FNAC results were compared with final histopathological diagnosis in 31 patients. Taking histopathology as gold standard criteria, sensitivity, specificity, positive predictive value and negative predictive value of FNAC for detection of various lesions were calculated. The sensitivity of a test is the ability of a test to identify correctly all those who have the disease (True positive/True positive + False negative). The specificity of a test is the ability of the study to identify correctly the candidates who do not have the disease. (True negative /True negative +False positive). The positive predictive value of a test indicates the probability that the patient with a positive test has, in fact, the disease in question (True Positive / True Positive + False Positive). The negative predictive value of a test indicates the probability of a patient with a negative test not having the disease in question (True negative / True negative + False negative).

Formula used for detection of sensitivity, specificity, positive predictive value and negative predictive value was as follows:

Sensitivity = (True positive / True positive + False negative) x100

Specificity = (True negative / True negative + False positive) x100

Positive predictive value = (True Positive / True Positive + False Positive) x100

Negative predictive value= (True negative / True negative + False negative) x100

RESULTS

A total of 277 cases of FNAC of breast Lumps were obtained, out of which histopathological correlation was available in only 31 (11.19%) cases. FNAC and histopathology results were grouped into five diagnostic categories (Table 1). Out of 12 histopathologically confirmed malignant cases, 8 cases were diagnosed as malignant on FNAC, two cases as suspicious for

malignancy, one case as atypical hyperplasia and one as benign mammary lesion. There was not even a single case which was diagnosed as malignant on FNAC and later turned out to be benign on histopathology. Out of 31 cases where histopathology was available, in 28 cases the FNAC diagnoses correlated well with the final histopathological diagnosis (Table 2). In the remaining 3 cases, one was diagnosed as benign mammary lesion and others as atypical hyperplasia on FNAC. On histopathological examination all 3 showed infiltrating ductal carcinoma (Fig.1). In our study 28 cases were true positive, 3 were false negative and no false positive. Since female without any breast lump was not included in this study, we had no true negatives or female with normal breasts. So we calculated 19 cases (17 benign and 2 inflammatory on histopathology) as true negatives which were also diagnosed as benign and inflammatory lesions on FNAC. The Sensitivity, Specificity, Positive predictive value and Negative predictive value of FNAC is shown in Table 3.

DISCUSSION

Breast lump have always commanded a great deal of attention because of fear of their being cancerous. Most of breast disease takes the form of palpable lump, sometimes painful and most of these conditions have possible confusion clinically with cancer [7]. Women breast lump are in a state of anxiety. Hence a quick diagnosis of lump in the breast is essential. FNAC of breast lump is an accepted and established method to determine the nature of breast lump with high degree of accuracy [8,9,10,11]. This study was aimed to assess the efficacy of FNAC in breast lump evaluation with regards to sensitivity, specificity, positive predictive value and negative predictive value. Our study revealed the sensitivity of 90.32% and specificity of 100% which were in accordance to sensitivity of 77-99% and specificity of 92-100% reported in

various studies[12-18]. In the present study, cases suspicious for malignancy and with atypical hyperplasia were found to be infiltrating ductal carcinoma following biopsy. This emphasizes need for further evaluation of such lesions, which often prove to be malignant [17]. This study also documented the fact that the benign lesions of breast are the most common lesions. This increased case of benign lesions indicates increase in awareness of patients. In such lesions the reassurance is the main line of treatment though close follow up is mandatory.

CONCLUSION

It is concluded that FNAC is an ideal adjunct tool in cancer program and management of patients presenting with breast lump as it helps in early diagnosis. It is a rapid, relatively atraumatic and accurate method for the diagnosis of breast lumps. It is highly accurate and has low false positive and false negative diagnosis. It can be carried out safely as a preoperative diagnostic method in patients with breast lump, mostly in outpatient department. Mastectomies can be prevented by early diagnosis and open biopsies need can be reduced. So it is recommended that FNAC should be used as a routine diagnostic method to maximise availability of health care to patients with breast lesions.

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**Table 1: FNAC & histopathology results grouped into various diagnostic categories.**

Diagnostic categories	FNAC	Histopathology
Inflammatory	2	2
Benign	18	17
Atypical	1	-
Suspicious	2	-
Malignant	8	12
Total	31	31

Table 2: FNAC & Histopathological correlation of 31 cases

FNAC & Histopathology Correlation	Diseased	Not diseased
Positive	28	-
Negative	3	-
Total	31	-

Table 3: Sensitivity, specificity, Positive & negative predictive value.

Senstivity	90.32%
Specificity	100%
Positive Predictive Value	100%
Negative Predictive value	86.36%
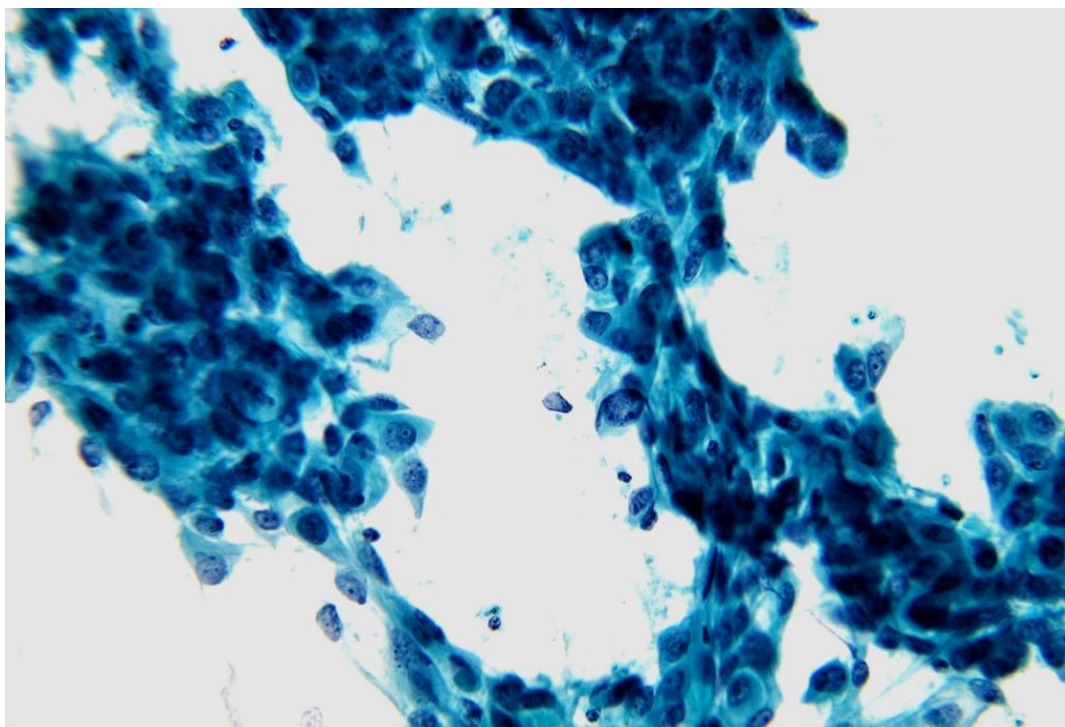
Fig.1. FNAC revealing malignant cells arranged in papillaroid pattern in a case of Infiltrating ductal carcinoma breast (Pap stain X400)