

Study of fine needle aspiration cytology of breast lumps and its histopathological correlation in Pokhara Valley

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ABSTRACT

Breast carcinoma is the leading cause of cancer death in women. Most of the time breast carcinoma presents as breast lump. Fine Needle Aspiration Cytology (FNAC) is a convenient and rapid preoperative diagnostic procedure. This is a prospective and correlative study done in department of Pathology of Manipal Teaching Hospital, Pokhara from December 2003 to December 2005. FNAC was performed in patients presenting with breast lump and its findings were correlated with histopathological findings. Out of total 343 cases of breast FNAC, 73 cases had histopathology correlation. Age group of the patient ranged from 17 to 84 years. Breast lumps were most commonly seen in age group 21 to 30 years which comprises of benign lesions. Maximum number of malignancy (26%) was seen in age group 41 to 50 years. Out of 73 cases, malignancy was seen in 15 cases (20.5%). The most common carcinoma was Invasive Ductal Carcinoma (IDC) with 46.7% cases. With correlation of FNAC and histopathology, the sensitivity and specificity of both benign and malignant lesions were high. In malignant lesions, the sensitivity and specificity were 93.3% and 100% respectively.

FNAC is a safe diagnostic procedure in the preoperative diagnosis of breast lumps in our setting. It gives the accurate result with proper technique and interpretation.

Keywords: Benign, breast lump, FNAC, histopathology, malignant.

INTRODUCTION

Aspiration cytology of tumors was introduced in 1920 by surgeon Hayes Martin with Edward Ellis.¹ In the early 1930's, a vast experience in the diagnosis of breast lumps by needle biopsy had been accumulated in many parts of the world.¹ After that FNAC began to flourish during 1950's and 1960's. Now it has become the routine procedure in most of the laboratories the world over. FNAC has been the preferred initial diagnostic procedure in the breast lumps.² Eighty percent of breast carcinomas is diagnosed by FNAC.^{1,2} With reliable FNAC diagnosis, in expert hands, the patient can avoid further unnecessary biopsy and surgical intervention.³ It is an excellent cost effective diagnostic modality. The diagnostic accuracy of FNAC of breast lumps is very high. This study was undertaken to evaluate the efficacy of FNAC in pre operative diagnosis of breast lump and its histopathological correlation in the management of breast lumps.

MATERIALS AND METHODS

This is a prospective and correlative study done in department Pathology of Manipal Teaching Hospital, Pokhara from December 2003 to December 2005. Patients presenting with breast lump in the Surgery and Gynaecology OPD of Manipal Teaching Hospital was sent to Department of Pathology for FNAC. Relevant

clinical history and details of the patient were taken as per the proforma. FNAC procedure was carried out with all necessary precaution using 23 gauge needle attached to 10cc disposable plastic syringe. Smears were stained with Leishman stain and Papanicolaou stain and then examined. Histopathological studies were carried out in all those cases where surgical biopsies were available. Special stains like Periodic acid Schiff (PAS) stain and Mucicarmine stain were done wherever required. The histopathological findings were correlated with FNAC.

All age group of the female patient with breast lump coming to Department of Pathology were included for the study. Exclusion criteria were cases whose biopsy was not submitted to the laboratory and cases with only histopathology but no FNAC.

Data was coded and entered in SPSS (Statistical Package for Social Sciences), version 10. Descriptive statistics were calculated.

RESULTS

The total number of breast FNACs done in the department during two years period was 343 (18.8%). Out of 343 cases of breast FNAC, 73 cases had histopathology correlation. Age of the patient ranged from 17 years to 84 years with an arithmetic mean age of 35.9 years. There were 38 cases (52%) in the left

Table-1: FNAC diagnosis

Diagnosis	No. of cases (%)
Fibroadenoma	29 cases (39.7%)
Fibrocystic breast disease	16 cases (21.9%)
Carcinoma	11 cases (15.1%)
Inflammatory lesions	10 cases (13.7%)
Lactational change	1 case (1.4%)
Suspicious for malignancy	3 cases (4.1%)
Others	3 cases (4.1%)
Total	73 cases (100%)

breast and 31 cases (42.5%) in the right breast. Only 4 cases (5.5%) were bilateral. Maximum cases of malignancy were on the right side, 9 cases (60%) out of 15 cases. Out of the four quadrants, lumps were commonly seen in the upper outer quadrant (UOQ), 33 cases (45.2%). Out of 15 malignant cases, axillary lymph node metastasis were seen in 5 cases (33.3%). 4 cases (80%) were of invasive ductal carcinoma and 1 case (20%) was of medullary carcinoma.

In FNAC, 14 cases (19.2%) were diagnosed as malignant lesions. Other FNAC diagnosis is tabulated in Table-1. In 3 cases, FNAC diagnosis was not possible in spite of repeated aspiration due to scant cellularity. These cases were diagnosed on histopathology.

All the FNAC diagnosis was correlated with histopathology. Carcinomas were seen in 20.5% cases (Table-2). 3 cases where FNAC diagnosis was not possible were cases of lipoma, cysticercosis and mammary myxoma.

Histopatholgy showed that the most common carcinoma was Invasive Ductal Carcinoma (IDC) (Fig. 1 and 2). It was seen in 46.7% cases. Similarly, Ductal Carcinoma In Situ (DCIS) was seen in 13.3% cases. Lobular

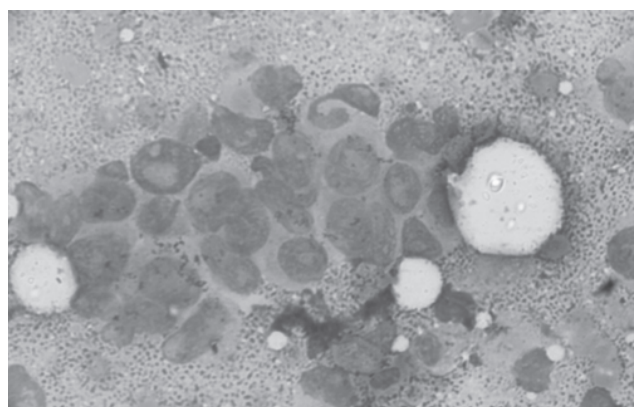


Fig. 1. Ductal carcinoma, FNAC (400X, Leishman stain)

Carcinoma In Situ (LCIS) and Medullary carcinoma was seen in 13.3% cases respectively (Fig. 3-6). The sensitivity and specificity of breast FNAC in diagnosis of malignancy were 93.3% and 100% respectively. There was no false positive case and false negative was 6.7%.

DISCUSSION

Going back to history, human cytology developed in 19th century by recognition of the epithelial origin of carcinoma by Thiersch and Waldeyer. Waldeyer, in 1867, advocated epithelial origin of breast cancer. For over 100 years, it was only histopathology which was giving the diagnosis.¹ After the introduction of aspiration cytology in 1920 by surgeon Hayes Martin, Dudgeon and Patrick in 1927 proposed the needling of tumors for rapid diagnosis. Then not very late, in 1930, Martin and Ellis were advocates of needle aspiration.¹ To avoid unnecessary biopsy FNAC is indicated in almost all types of breast lump. It can diagnose 80% of malignant cases with good sensitivity and specificity.⁴⁻⁶ When FNAC is performed by the pathologist, the accuracy rate is high. FNAC is a convenient and rapid technique for the preoperative diagnosis and subsequent post operative follow up of the patients with breast lumps.

Table-2: Correlation of FNAC and histopathological diagnosis

Biopsy \ FNAC	Carcinoma	Fibroade noma	Fibrocystic breast disease	Inflammatory	Lactating adenoma	Others	Total
Carcinoma	11						11
Fibroadenoma	1	24	2	1		1	28
Fibrocystic breast disease		2	14				16
Inflammatory				10			10
Lactating adenoma					1		1
Suspicious for Carcinoma	3						3
Others						3	3
Total	15	26	16	11	1	4	73

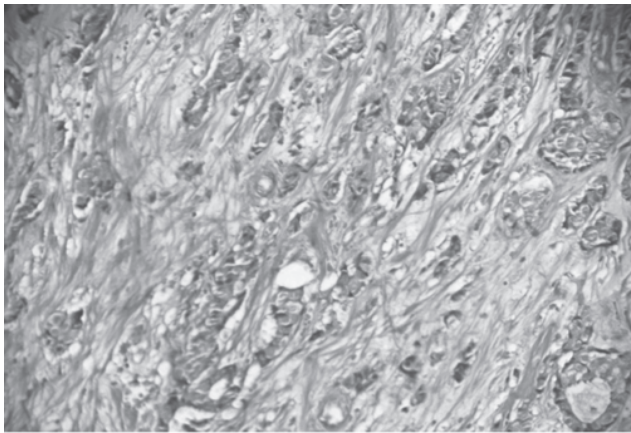


Fig. 2. Invasive ductal carcinoma, histopathology (400 X H and E)

Breast carcinoma is the leading cause of cancer death in women with peak incidence in 30 to 39 years. Similar findings were seen in studies done by Yong *et al* in Singapore and by Mbonde *et al* in Africa.^{7,8} The most involved quadrant was upper outer quadrant (UOQ). This same finding is seen in this study also (45.2%) and it correlates well with studies done by Sabban *et al* and Chen *et al* where 87.5% and 46% of the breast lumps were seen in the UOQ respectively.^{9,10}

Most of the breast lumps are benign. In the present study benign lesions were seen in 58 cases (79.5%) and malignant lesions were seen in 15 cases (20.5%). It correlates with study done by Dennison *et al*. In his study, out of 143 cases, 73.4% cases were benign lesions and 26.6% were malignant.¹¹

In our study, it was seen that fibroadenoma, fibrocystic breast disease and inflammatory lesions are the most common benign lesions. Similar findings were observed by Dutta *et al*, Otu *et al* and Devitt *et al*. In their studies more than 90% of the breast lesions were fibroadenoma, fibrocystic breast disease and inflammatory lesions.¹²⁻¹⁴

There were 20.5% cases of malignant lesions in the present study. The sensitivity of FNAC for malignancy

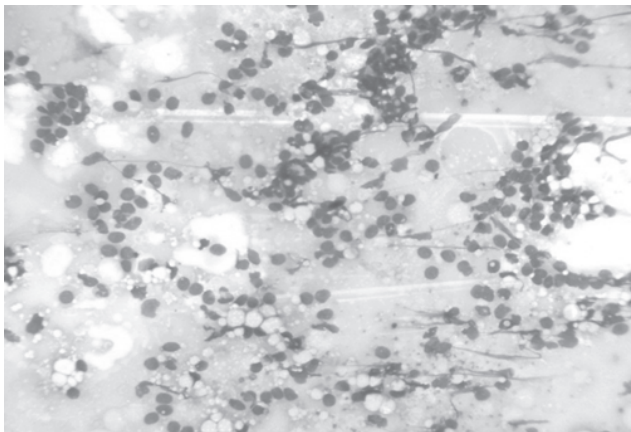


Fig. 3. Lobular carcinoma, FNAC (400X, Leishman stain)

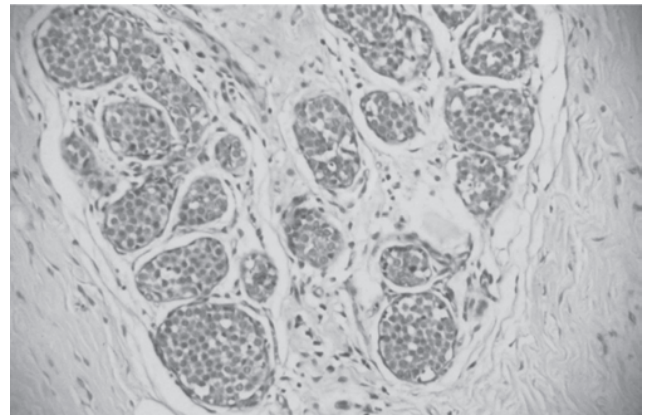


Fig. 4. Lobular carcinoma in situ, histopathology (400 X H and E)

was 93.3%, specificity was 100% and false negative (FN) was 6.7%. There was no false positive (FP) case. This correlates well with study done by Yu *et al* which showed more than 75% of sensitivity and more than 90% of specificity on FNAC diagnosis.¹⁵

In expert hands, false positive cases and false negative cases of FNAC are very rare. These few cases are due to procedure errors. In the present study, there was one (6.7%) false negative case on FNAC of malignant lesion. This case was given as fibroadenoma on FNAC. However, histopathological examination of the lumpectomy specimen revealed DCIS with phyllodes tumor. So this error could be due to the wrong site of FNAC and it could not hit the exact site of DCIS. This correlates with other studies done by Hussain *et al*, Khatun *et al* and Catherine *et al*.¹⁶⁻¹⁸ In another study done by Young *et al*, the overall false negative rate was 6.2% and overall false positive rate was 1.1%.¹⁹

In the present study there were no false positive cases. The false-positive cases of malignancy on FNAC diagnoses are very few if done in expert hands. Homesh *et al* showed that the false positive rate was 1.5% in his study of breast lumps.²⁰

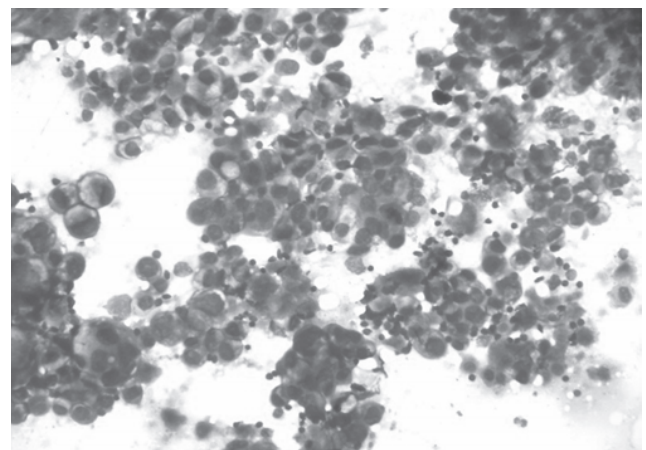


Fig. 5. Medullary carcinoma, FNAC (400X, Leishman stain)

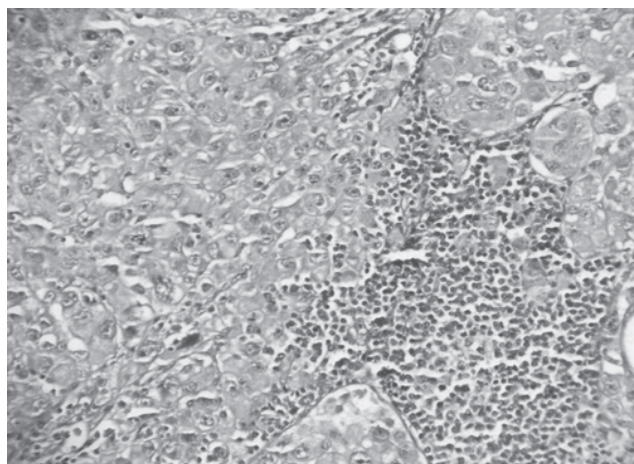


Fig. 6. Medullary carcinoma, histopathology (400 X H and E)

Ductal carcinoma is the commonest type of breast carcinoma seen worldwide and in the present study as well. The most common type was IDC and second most common was DCIS. Out of 15 cases of malignant lesions, 7 cases (46.7%) were of IDC. Other cases were of DCIS - 4 cases (26.7%), medullary carcinoma - 2 cases (13.3%) and LCIS - 2 cases (13.3%). This correlates well with many studies. Dutta *et al*, Gogo *et al* and Rajesh *et al* had shown that IDC was the commonest morphological type.^{15,21,22} It was the commonest type in different parts of the world like Pakistan, Iran and Africa.²³⁻²⁵ Studies done in Nepal also shows that ductal carcinoma is the commonest type.^{26, 27}

In our study, 80% of the lymph node metastasis was from invasive ductal carcinoma. It correlates well with finding of Usmani *et al* where 73% cases had lymph node metastasis and most of the cases were of IDC.²³

Three cases were not diagnosed on FNAC. These were cases of cutaneous mammary myxoma, cysticercosis and lipoma. Studies of mammary myxoma showed that the definitive diagnosis was achieved by histopathology.²⁸ Similarly diagnosis of cysticercosis was also achieved on histopathology however in expert hands it can be diagnosed on FNAC. In studies done in Nepal, quite a number of cysticercosis was seen in breast.²⁹⁻³¹ In a study done by Lanug *et al*, 'Lipoma of the breast: a diagnostic dilemma' 74% cases of lipoma of breast revealed only fat cells on FNAC.³²

In the present study FNAC sensitivity and specificity of malignant and benign lesions were high with very low FP and FN cases. FNAC reduces the cost and anxiety of the patient and helps the surgeon to plan surgery. Being simple and fast, FNAC is a complementary to histopathology.

FNAC if done properly gives the good accuracy rate. But still due to some default in the procedure, existence

of false positive and false negative cases cannot be omitted. In spite of repeated aspirations, if diagnosis is not obtained by FNAC we can always ask surgeon for the biopsy which is the gold standard. Clinical evaluation and peer review are two important aspects in the proper diagnosis. Last but not the least, combined efforts of Pathologist and Physicians will always come up with an excellent outcome.

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