Original Article

CORRELATION OF FNAC AND HISTOLOGICAL DIAGNOSIS IN THE EVALUATION OF BREAST LUMPS

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ABSTRACT

Objective:

To correlate the cytological findings of breast lumps with their histomorphological diagnosis on excision.

Materials and methods:

This comparative study was conducted in the Department of Pathology, University Medical and Dental College, Faisalabad from September 2008 to December 2011. All women who had a clinically palpable breast lump were subjected to fine needle aspiration cytology (FNAC) which was followed by an excision biopsy.

Results:

Fifty six patients who presented with a breast lump in the surgical and gynecological department at Madina Teaching Hospital were referred to the Pathology Department for FNAC. Thirty one were reported as C2 lesions, 1 was reported as C3, 1 as C4 and 23 cases were reported as C5 lesions.

On histopathological examination, out of 31 cases which were reported as C2 lesions, 30 were benign while 1 case turned out to be medullary carcinoma of the breast (false negative).

The case which was reported as C3 turned out to be a benign lesion-giant fibroadenoma-on histopathology. The case which was diagnosed as C4 lesion turned out to be carcinoma on histopathology. All the 23 cases which were diagnosed as C5 lesion on FNAC proved to be malignant on histopathology.

Conclusion:

Breast cytology is an effective and rapid method of diagnosis of breast diseases. It helps in deciding which patient needs an early open biopsy.

Keywords: Breast lumps, Fine needle aspiration cytology (FNAC), open biopsy.

INTRODUCTION

Breast disorders/lumps are a fairly common presenting feature in our outpatient department. They are mostly benign and of no serious consequences but malignancy contributed a significant percentage of breast lumps[1]. There is increasing awareness and the associated anxiety and stress among women, who perceive every symptom in breast as carcinoma, compels the patients to seek medical advice. It is sometimes difficult to determine whether a suspicious lump is benign or malignant simply from clinical assessment.[2] Therefore a method of definitive diagnosis of patients who present with breast lumps at the outpatient clinic is needed in order to reassure the patients and to offer the best possible treatment. A confident diagnosis can be made in 95% of the cases through a combination of clinical examination, imaging and FNAC.[3] FNAC is a relatively simple, reliable, atraumatic, economical and complication free technique for the evaluation of mass lesions. It can be easily repeated if an adequate aspirate is not obtained.[2]

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FNAC of a breast lump is an accepted and established method to determine the nature of a breast lump. The investigation of the pathological lesion by extraction of the cells through a fine bore needle for microscopic examination to arrive at a diagnostic decision is a useful and cost effective technique.[4] FNAC has superceded the use of frozen section examination in the diagnosis and management of patients with breast cancer.[5,6] The biopsy of the palpable breast lesion based on the histological study of the tissue specimens can provide all the reliable information to the surgeon and oncologist for modern therapeutic strategy in decision making regarding the patients treatment. It permits the eventual use of neo adjuvant therapy.[7]

As fine-needle aspiration (FNA) has become a critical component in the investigation of palpable breast masses; false-negative diagnoses have become a major concern, prompting re-evaluation of the definition of specimen adequacy. Although cyto-pathologists agree that a number of parameters relate to the adequacy of an FNA specimen, there is no consensus on the role of epithelial cell quantitation in the determination of an adequate FNA.[8] Different studies show that the FNAC has the sensitivity range from 80 to 98% and the specificity range of more than 99-100%.[3] Advantage is that when the cytological diagnosis is established, the nature of the condition can be discussed with the patient and a full explanation of the proposed operation, length of stay in the hospital and after care can be given.

FNAC is widely used in Pakistan as a reliable, rapid, cost-effective, complication free, and an accurate diagnostic modality for the evaluation or management of breast lumps. This study was conducted to correlate the cytological findings of breast lumps in patients presenting in the outpatient department of our hospital with their histomorphological findings.[6]

MATERIALS AND METHODS

Setting:

This study was conducted at Pathology Department of University Medical and Dental College, Faisalabad.

Study duration:

The study was conducted for 40 months from September 2008 to December 2011.

Sample size:

Fifty six patients were included in this study.

Sampling technique:

Non-probability convenient sampling.

Sample selection

Inclusion criteria

All female with unknown primary diagnosis of breast mass/lumps undergoing FNAC followed by excision biopsy/lumpectomies or mastectomy.

Exclusion criteria

1. Patients with recurrent malignancy.
2. Patients who underwent FNAC but did not undergo subsequent histopathological diagnosis.
3. Patients undergoing chemotherapeutic treatment

Procedure for FNAC

A written consent was taken before performing the FNAC. FNA was done using 5ml or 10mL disposable syringe of Becton and Dickinson Pakistan (Pvt) for each prick and for each patient. No local anesthetic was used. The needle was inserted into the palpable lesions, either once or twice depending upon the size of the nodule. Cellular material was aspirated into a syringe and expelled onto slides. Six to eight slides were prepared for each patient. A small or medium-sized drop of aspirate was put near the frosted end of a slide that was placed on a table. A second slide was used to spread the aspirated material in the same manner used to prepare a peripheral blood smear (Figure 1). One of the smears was wet fixed in 95% methanol and stained with Hematoxylin and Eosin (H&E). The air dried smears were stained with Giemsa stain. The procedure was done within one hour, and the reports were signed out within 1-2 days.

Criteria for adequacy:

There should be at least six clusters of ductal cells on each smear comprising 10 cells per cluster. At least two to three passes are made from the lump from all aspects. Cytology reporting was based on the following NHS guidelines.[8]

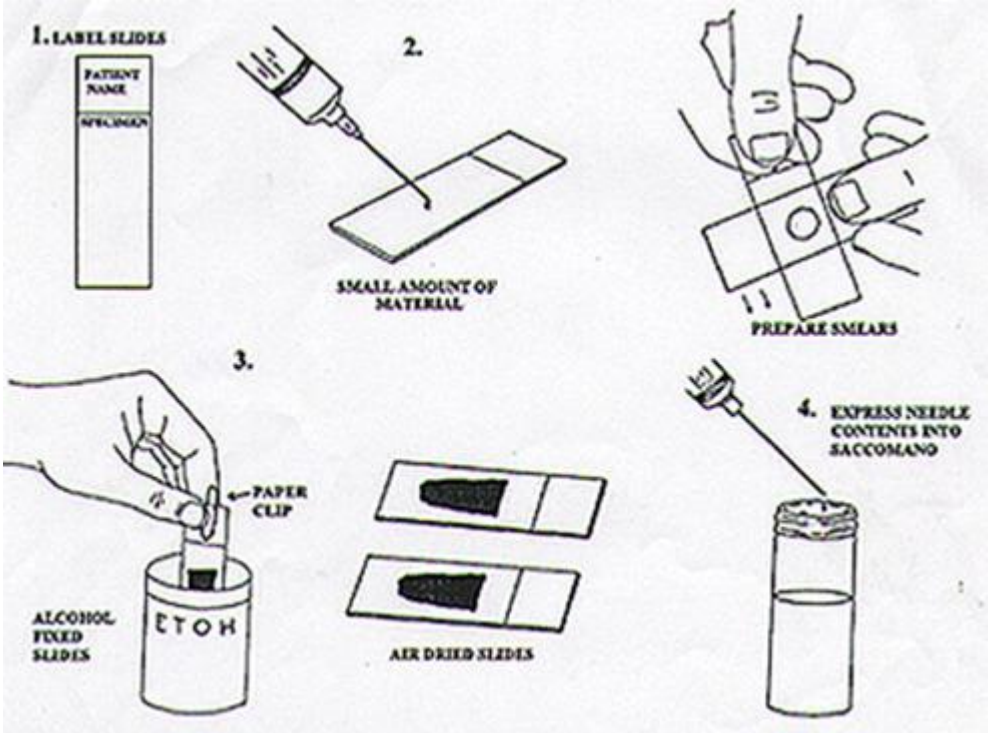

Figure 1. Procedure for smear preparation and fixation

1. C1= Not representative of the lesion
2. C2= Benign
3. C3= Borderline benign
4. C4= Malignant/suspicious for malignancy
5. C5= Malignant

Criteria for malignancy:

The morphological characteristics that were used to distinguish benign from malignant cells are as follows:

1. Abnormal grouping of cells
2. Decreased mutual adhesiveness
3. Presence of foreign cells
4. Changes in the nucleus
5. Increased/abnormal mitoses
6. Variation in size and shape of cells
7. Abnormal cytoplasmic inclusions

Procedure for histopathology:

The biopsy specimens were fixed in 10% formalin for 24 hours. Then gross examination was done in the Department of Pathology by consultant histopathologists. The gross and cut section findings were noted. Several bits were taken from appropriate sites for processing and paraffin embedding. From each block, sections were cut at 4-5 microns thickness and stained with H&E.

RESULTS

The age range of total 56 patients was 15-70 years with mean age of 34.91. Out of these 56 patients 31 patients had benign lesions and 25 had malignant tumors. The highest frequency of benign breast lumps were mostly in the age range of 15-30 years (Figure 2) and the highest frequency of malignant breast lumps were found in the age group of 40-65 years (Figure 3).

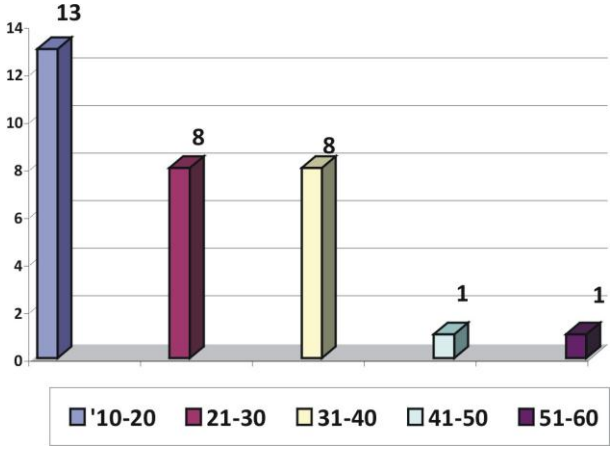

Figure 2. Age distribution of the patients with Benign breast lumps

Cytological diagnosis:

On cytology 31 patients had C2 lesions. Out of these 31 cases 22 lesions were reported as fibroadenoma, 7 as fibrocystic disease and 2 as breast abscess (Figure 4).
Two cases were reported as having C3 and C4 lesions respectively and excision biopsy/ lumpectomy was advised.
Twenty three patients had a C5 lesion which is definitive of carcinoma breast (Figure 5) and these patients underwent mastectomy.

Histological findings:

Out of a total of 56 cases, who underwent surgical procedures 31 were reported as benign lesions. Among these 31 benign cases 23 were reported as fibroadenomas (Figure 6) one was diagnosed as benign phylloides tumor and 7 as fibrocystic disease. Among these seven cases of fibrocystic disease two had additional features of acute mastitis leading to breast abscess formation and one had

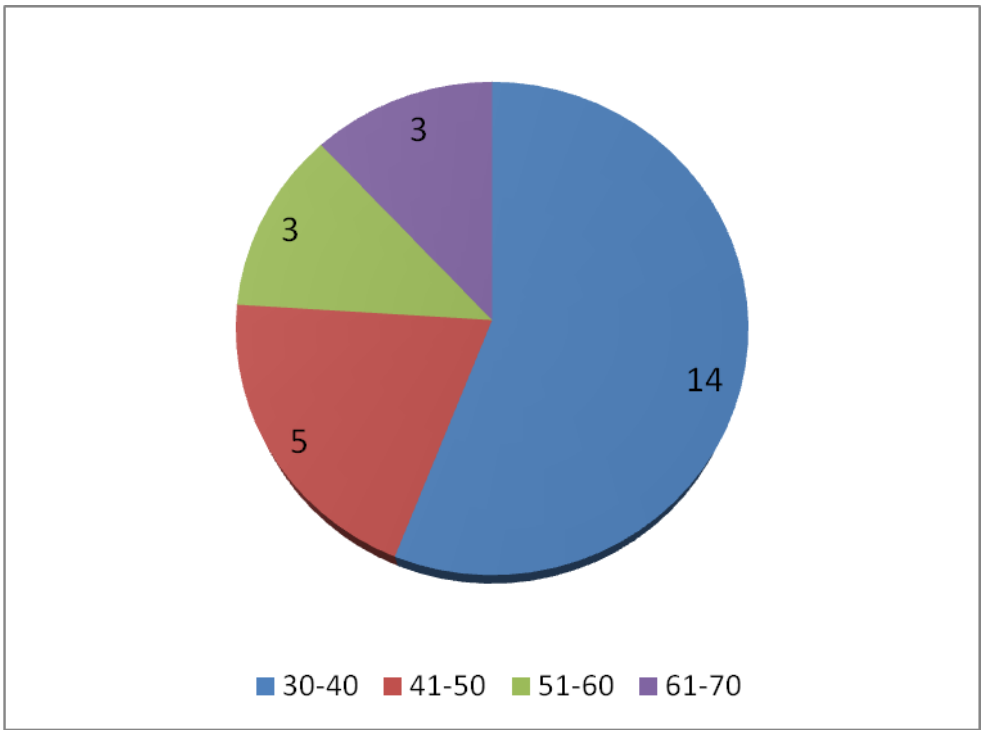

Figure 3. Age distribution of patients with Malignan breast lumps

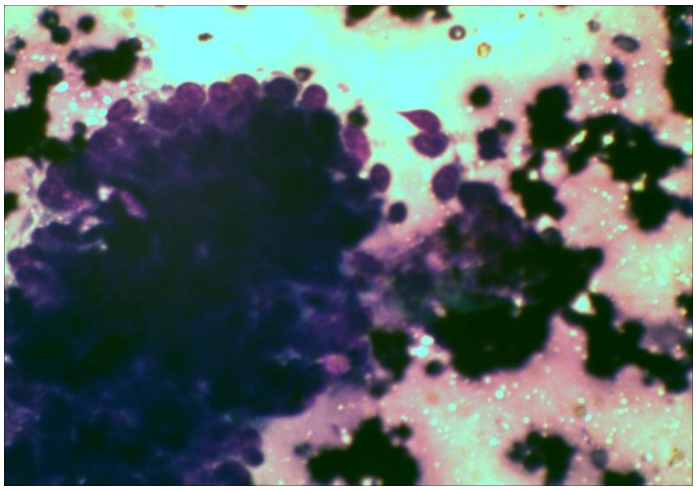

Figure 4. Photomicrograph of C2 lesion

coexisting intraductal papilloma.

The rest of 25 cases were diagnosed as carcinoma (Figure 7) of the breast on histopathology. Among the malignant tumors there were 23 cases of infiltrating ductal carcinoma, one was a case of insitu ductal carcinoma with comedo pattern of necrosis, and one case was of medullary carcinoma of

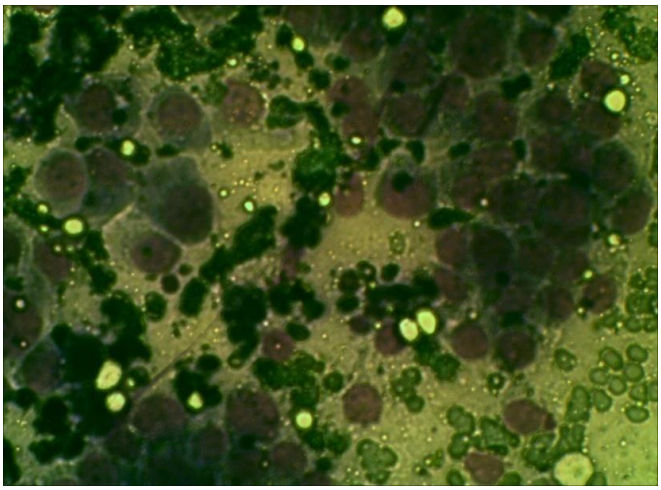

Figure 5. Photomicrograph of C5 lesion

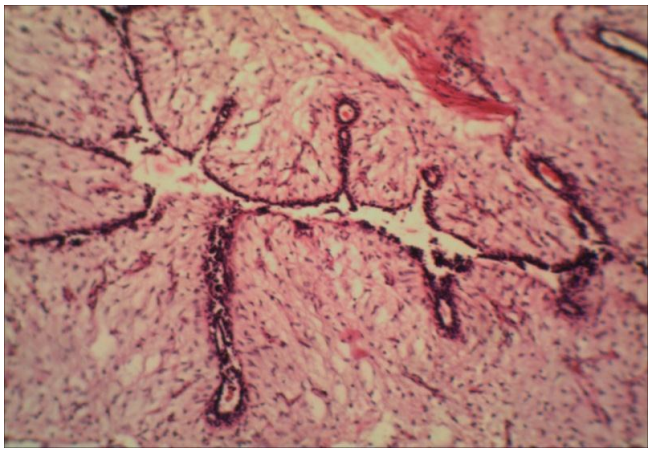

Figure 6. Photomicrograph of fibroadenoma

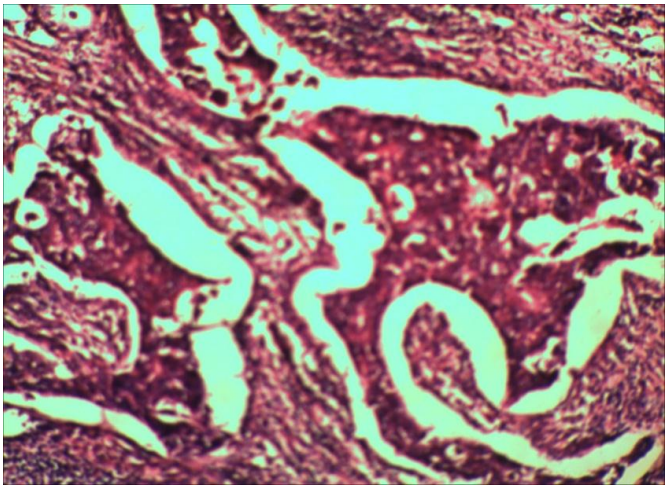

Figure 7. Photomicrograph of infiltrating ductal carcinoma

breast. Out of 23 cases of infiltrating ductal carcinoma four cases were reported as poorly differentiated infiltrating ductal carcinoma falling in grade III and nineteen were reported as moderately differentiated infiltrating ductal carcinoma falling in grade II.

One case was reported as C2 lesion (false negative) and excision biopsy was advised which later on proved to be medullary carcinoma of breast. The case which was diagnosed as C3 lesion came out to be a giant fibroadenoma. The case which was given as C4 lesion turned out to be malignant on histopathology. A comparison of the results of FNAC and histopathology are compared in Table 1.

Table 1. Fine needle aspiration cytology versus histopathology (n=56)

No. of patients	FNAC	Histopathology Results	
		Benign (n=31)	Malignant (n=25)
0	C1- Unsatisfactory	0	0
31	C2- Benign	30	1
1	C3- Benign with atypia	1	0
1	C4- Suspicious	0	1
23	C5- Malignant	0	23

DISCUSSION

In this study the sensitivity of the test to diagnose breast diseases was 96.42% and the specificity was 100%. Sensitivity of FNAC obtained by various workers ranged from 97-100% and this study correlate with that work. These results were also close to a study performed at Saidu[3] teaching hospital of Swat from July 2007 to December 2010 which depicts the 95.23% sensitivity of FNAC for malignant cases and 99.2% for benign cases. Other study conducted by Waqar[9] tells the sensitivity of FNAC almost 92.6%. Similarly in a study performed by Issac[10] it was 96.4%. So there is strong correlation between cytologically diagnosed cases with their histological diagnosis.

Benign breast diseases are 10 times more common than breast cancers. Reassurance following the exclusion of cancer is the keystone of management for majority of the cases. Due to lack of education the women disregard the lump. Fibroadenoma is the common benign breast lump in majority of the young female. The patients want removal because of fear of malignancy.[11]

Breast cancer is one of the common clinical problems in our country. Although there has been a little success in preventing breast cancer, significant reduction of mortality could be achieved through early detection. It is a general consensus that a firm preoperative diagnosis should be established and FNAC is extremely useful diagnostic technique.

Fine-needle aspiration cytology is widely used in the diagnosis of breast cancer because it is an excellent, safe, and cost-effective diagnostic procedure. One can get on site immediate report with minimal cost using inexpensive equipments and a simple technique. The most significant advantage of FNAC is the high degree of accuracy, rapid results, and a less invasive procedure than a tissue biopsy. FNAC of the breast can reduce the number of open breast biopsies.[7]

FNAC has some pitfalls in the diagnosis of fibrocystic disease (FCD), adenosis, epithelial hyperplasia with or without atypia, apocrine metaplasia, radial scar, and papilloma. Fibroadenoma and these benign lesions are more common in our setup. Various types of adenosis have also been described, of which sclerosing adenosis and microglandular adenosis merit detailed description and most of these lesions mimic malignant lesions.[5]

Before the introduction of FNAC, open biopsy/trucut biopsy was carried out in only suspicious cases. In our experience, FNAC results are more reliable regarding malignant lesions; however the category of "Suspicious for Malignant Lesions" needs histopathological evaluation before performing surgical measures. Self-assessment, mammography, and tru-cut biopsy may help in the accuracy of these lesions.[2]

It is widely accepted that FNA is a less traumatic and easy technique than core needle biopsy because we repeated the FNAC in case of inadequate smears without any delay, difficulty, trauma, and getting highly accurate results. This statement is not applicable for open biopsy as it is a time consuming and cumbersome technique which requires fixation, processing, staining and so forth. It is also expensive procedure costing more as compared to Rs 200 for each FNA while it is also expensive in advanced countries. In a study Rubin et al. has mentioned a saving of $ 1000 with this cost effective procedures. In our study the accuracy of FNA aspiration was increased by repeating the process within an hour and was found to be significant.

CONCLUSION

The present study shows that FNA is a reliable method. It helps to confirm the clinical diagnosis without open biopsy. It helps to take the decision for mode of surgery. From this study it can be concluded that diagnosis of breast lesion based on FNAC should be practiced as a routine procedure as there is high degree of correlation with histopathologic findings. FNAC is also an ideal method for patients follow up if there is recurrence of breast lump. In the presence of budget constraints and personnel shortage, hospitals are required to demonstrate even great cost effectiveness in the diagnosis of breast lesions. Accurate preoperative assessment of breast lesions is becoming increasingly important. FNAC should be used as a routine diagnostic procedure due to its cost effectiveness, thus maximizing the availability of health care to patients with breast lesions.

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