ORIGINAL ARTICLE

DIAGNOSTIC PERFORMANCE OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) IN THE DIAGNOSIS OF BREAST LUMPS

Sayed Agha Ali Shah, Shagufta Nasir Pervez*, Khalid Javed**

Department of Pathology, Rehman Medical Institute, Institute of Kidney Diseases, Hayatabad Medical Complex, **Khyber Girls Medical College, Peshawar, Pakistan

Objective: The aim of the study was to evaluate the diagnostic performance of fine needle aspiration cytology in the diagnosis of breast lumps. **Methods:** All patients who underwent FNA breast lumps at Rehman Medical Institute, Peshawar during 2006 to 2008 were included in this descriptive cross-sectional study. The FNA procedure was performed & interpreted by experienced cyto-pathologists. FNAC of 102 breast lumps were analysed. **Results:** The age range of the patients was 15–80 years (mean 38.11 years). Inadequate cases were 2.94%, malignant 30.39%, atypical/suspicious of malignancy 6.86%, and benign 59.80%. Malignant lesions predominated in the 5th and 6th and benign in the 3rd and 4th decades of life. **Conclusion:** FNAC of breast is simple, cost-effective and less traumatic method for diagnosis of breast lumps. Combined with physical examination and imaging studies, it is a highly sensitive diagnostic tool and can reduce the need for open biopsy.

Keywords: FNAC, Breast lumps, Breast cancer, Breast, Diagnosis, Cytology

J Ayub Med Coll Abbottabad 2013;25(1-2):46–8

INTRODUCTION

First report of FNAC as a technique for obtaining diagnostic material dates back to 19th Century by Kun in 1847.[1] It was introduced into the clinical practice by Ellis and Martin in the 1930s.[2] Royal College of Pathologists in 1989 produced guidelines for its use in the diagnosis of breast lumps in the National Health ServiceUK.[3] In Pakistan because of increasing awareness of breast cancer in the general public, lump breast FNAC has become a common practice. It has been demanding on the part of clinician to diagnose a breast lump correctly and speedily.[4]

FNAC can be very helpful to the clinicians in the early diagnosis and management of breast lesions. The technique is effectively being practiced as a diagnostic modality in our country and can be adopted as a routine pre-operative investigation for all accessible breast lumps.[5]

It is less traumatic, cost effective and can be easily performed as an outdoor procedure.[6] FNAC provides an added dimension to clinical management of breast lumps as it directs the clinicians to precede with definite therapy.

MATERIAL AND METHODS

A total number of 102 patients with breast lumps attending the Department of Pathology, Rehman Medical Institute, Peshawar were included in this study. All of those were female with age range of 15–80 years. Before starting FNA procedure a detailed clinical history and thorough clinical examination was carried out. The patients were informed about the procedure and written consent for FNA was taken.

Aspiration was performed using a 21–23 gauge needle attached to a 10 or 20 cc plastic syringe. Minimum of 4 smears were prepared. Two smears were air-dried and two were fixed in alcohol. Air-dried smears were stained with hemacolor (May-Grunwald-Giemsa stain) and alcohol-fixed were stained with Hematoxylin & Eosin, and Papanicolaou stain. In cystic lesions, complete evacuation of the cyst followed by needling of the cyst wall was carried out. All cases were immediately evaluated by experienced cyto-pathologist for adequacy of material. More passes were done in case of inadequate material. The number of needle passes varied from case to case and was mostly 1–3 passes. An atypical/ suspicious of malignancy diagnosis was rendered to cases that contained an admixture of regular cells and others with abnormal nuclear and cytoplasmic features falling short of a firm diagnosis of malignancy. Inadequate smears were either extremely hypo-cellular with regard to epithelial cells or blood stained to such an extent that all other elements were obscured.

RESULTS

Out of total 102 cases, 61 (59.80%) were benign, followed by 31 (30.39%) malignant, atypical/suspicious of malignancy in 7 (6.86%) and non-diagnostic in 3 (2.94%) cases. The age range was 15–80 years (mean age 47.5±35.96). The peak age group was 4th decade with 28 patients, followed by age group 3rd decade with 22 patients (Figure-1).

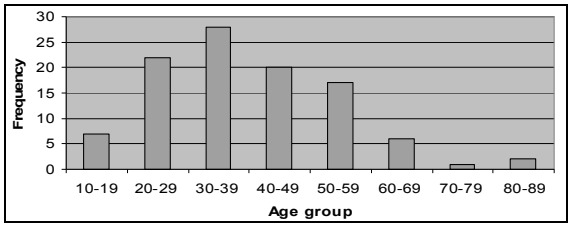


Figure-1: Age groups of the patients

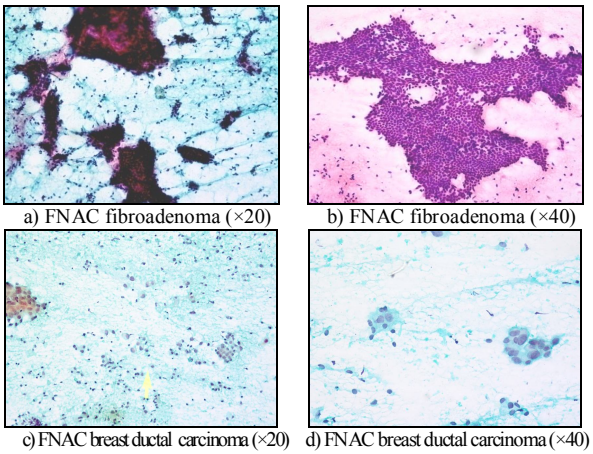
The atypical/suspicious of malignancy comprised 7 (6.86%) cases, mostly found in the 5th and 6th decades. Malignant lesions constituted 31 (30.39%) cases with ductal carcinoma predominating 27 cases (87.09%) mostly found in the 5th and 6th decades. Among the benign lesions, 14 (22.95 %) cases were fibro-adenoma, followed by fibrocystic changes 12 (19.67%) cases mostly found in the 3rd and 4thdecades. FNAC diagnosis of breast lumps is shown in Table-1.

Table-1: Diagnostic categories of all FNA samples

Diagnostic Category	No. of sample (%)
Inadequate	3 (02.94)
Benign	61 (59.80)
Fibro-adenoma	14 (22.95)
Fibrocystic change	12 (19.67)
Duct ectasia	11 (18.03)
Mastitis/abscess	7 (11.47)
Miscellaneous	17 (27.86)
Suspicious	7 (06.86)
Malignant	31 (30.39)
Ductal carcinoma	27 (87.09)
Lobular carcinoma	2 (6.45)
Meta-plastic carcinoma	1 (3.22)
Malignant phylloides tumor	1 (3.22)
Total	102 (100)

In fibro-adenoma, smears were cellular with large branching sheets of bland epithelial cells and many single bare bipolar nuclei in the background (Figure-2a). The cells were well knitted, uniform with mildly enlarged nuclei having bland granular chromatin (Figure-2b). Some smears contain benign ductal epithelial cells along with apocrine cells, macrophages, acute or chronic inflammatory cells and proteinaceous material.

Malignant cases smears were cellular with single population of epithelial cells, no myo-epithelial cells or bare bipolar nuclei. The cell clusters were irregular and mostly single epithelial cells with intact cytoplasm indicating loss of cell cohesion (Figure-2c). These cells exhibited moderate to severe nuclear atypia, enlargement, pleomorphism, coarse chromatin and irregular nuclear membrane (Figure-2d).



a) FNAC fibroadenoma (×20) b) FNAC fibroadenoma (×40)

c) FNAC breast ductal carcinoma (×20) d) FNAC breast ductal carcinoma (×40)

Figure-2: Photomicrographs of FNAC smears (×20)

DISCUSSION

FNAC of breast lump is an accepted and established method to determine the nature of breast lump with high degree of accuracy. It is safe with minimal discomfort to the patient and can be done as an out patient procedure. Increasing number of referrals for the procedure is due to high level of awareness among the clinicians of it's usefulness as a diagnostic tool and a necessary adjunct to clinical examination.[7] In clinical practice most of the patients with breast lump undergo FNA examination initially to rule out malignancy and to find out the cause of the lump. Excision biopsy of the lesion to establish whether it is benign or malignant is no longer an acceptable mode of diagnosis.[8] Only a small fraction of the patients, who are clinically, radiologically or cytologically suspicious of malignancy, underwent direct histopathological examination. Thus, FNA examination can provide information about the spectrum of breast lesions, since most of the cases with benign diagnosis do not undergo histological examination.[9,10]

In this study, we have examined 102 patients with breast lumps who underwent FNA procedure. A comparative analysis of our study with other studies is shown in Table-2. The FNAC findings in our study (benign 59.80% and malignant 30.39%) are similar to other local (56% and 24%)[4] and international (69% and 31%)[10],(70.4% and 4.4%)[11], (53.9% and 29.1%)[14] studies respectively. Other international studies showed a higher numbers in benign category (81.9%)[9] and (93.4%)[5].

In our study benign lesions of the breast were seen predominantly in the 3rd and 4th decades and malignant lesions were mostly in the 5th and 6th decades of life. However both diagnoses can occur in all age group. Therefore every case should be treated on its own merit. Because of predominance of benign lesion, the trend towards more conservative surgery and individualized treatment has increased the importance of close correlation of radiological, cytological and histological finding.[11]

Inadequate cases in our study were 3 (2.94 %), well within the range mentioned in the literature (0–42%).[11] Triple approach, i.e., correlation of cytology with the clinical findings and imaging results are mandatory for the responsible management of the patient especially in cases with inadequate yield,[12,13] Incorporating this data can accurately categorize the breast lesions in most of the cases and can help in selecting the therapeutic protocol (i.e., surgery vs cosmetic treatment, enucleation vs wide resection etc).[11,14]

A study conducted by Ahmad *et al* showed that when triple assessment is concordant, final treatment may be ensued without open biopsy. In non-

concordant cases, FNAC stands as the single most important investigation.[15] Other studies have also found that FNAC detects more malignancy than clinical examination with or without mammography.[16,17]

In our study, 7 (6.86%) cases were suspicious of malignancy. Published literature mentioned 3–9% range for suspicious of malignancy cases.[18,19] These cases should be confirmed by histopathologic examination. Approximately 75% of patients reported as suspicious of malignancy in FNA were later diagnosed as malignant on histopathology.[19] Therefore all patients diagnosed as suspicious of malignancy in FNA should undergo histopathologic examination for confirmation of diagnosis.

It has been observed by some studies that more malignancies were detected by fine needle aspiration then by clinical examination alone. This is particularly true in cases where the aspirator is more experienced therefore giving higher results.[17]

CONCLUSION

FNAC is a simple cost effective and less traumatic procedure for diagnosis of breast lumps. Benign breast lesions are common in 3rd and 4thdecades while malignant lesions are seen in the 5th and 6th decades. FNAC can be used in preoperative diagnosis of breast lumps, allowing earlier counselling and preparation for clinical management of the patient.

Table-2: Comparison with other studies

Reference	Country	Yr of Publication	Total number	% Malignant	% Benign	% Suspicious
Nguansangiam *et al*[14]	Thailand	2009	182	29.1	53.9	17
Qasim *et al*[4]	Pakistan	2009	100	24	56	12.5
Pradhan *et al*[9]	Nepal	2008	2246	15.49	81.9	2.32
Tiwari *et al*[5]	Nepal	2007	91	6.6	93.4	-
Medina *et al*[10]	Spain	2005	271	31	69	-
Yeoh *et al*[11]	Hong Kong	1998	1217	4.4	70.4	-
Current study	Pakistan	Present study	102	30.39	59.80	6.86

REFERENCES

1. Curling M. Fine needle aspiration of breast lesions. Practitioner 1985;229:221–3.
2. Haagesen CD. Disease of the breast. 3rd ed. Philadelphia: WB Saunders Company; 1986.
3. The Royal College of Pathologist working group for Breast Screening Pathology. Guidelines for Pathologist. NHSBP Publication No 2. Sheffield: NHS Breast screening Programme; 1989.
4. Qasim M, Ali J, Akbar SA, Mustafa S. Lump breast; Role of FNAC in diagnosis. Professional Med J 2009;16(2):2358.
5. Tiwari M. Role of fine needle aspiration cytology in diagnosis of breast lumps. Kathmandu Uni Med J 2007;5(2):215–7.
6. Hussain MT. Comparison of FNAC with excision biopsy of breast lump. J Coll Physicians Surg Pak 2005;15:211–4.
7. Naggada HA, Tahir MB, Musa AB, Gali BM, Mayun AA, Pindiga UH, *et al*. Correlation between histo-pathologic and fine needle aspiration cytology diagnosis of palpable breast lesions. A five review. Afr J Med Sci 2007;36:295–8.
8. Kocjan G. Needle aspiration cytology of the breast: Current perspective on the role in diagnosis and management. Acta Med Croatica 2008;62(4):391–401. [Article in Croatian]
9. Pradhan M, Dhakal HP. Study of breast lump of 2246 cases by Fine needle aspiration. J Nepal Med Assoc 2008;47(172):205–9.
10. Medina-Franco H, Abarca Perez L, Cortes-Gonzalez, Soto-Germes S, Ulloa JA, Uribe N. Fine needle aspiration biopsy of breast lesions: institutional experience. Rev Invest Clin 2005;57(3):394–8. [Article in Spanish]
11. Yeoh GPS, Chan KW. Fine needle aspiration of breast masses: an analysis of 1533 cases in private practice. Hong Kong Med J 1998;4:283–7.
12. Orell SR, Sterrett GF, Walter MN, Whitaker D. The breast manual and atlas of fine needle aspiration cytology. Edinburgh: Churchill Livingstone; 2005.p. 170.
13. Suen MWM, Chan MKM. The role of fine needle aspiration cytology in the diagnosis of breast lesions. Hong Kong Med J 1996;2:62–7.
14. Nguansangiam S, Jesdapatarakul S, Tangjitgamol S. Accuracy of fine needle aspiration cytology from breast masses in Thailand. Asian Pacific J Cancer Prev 2009;10:623–6.
15. Ahmed I, Nazir R, Chaudhry MY, Kundi S. Triple assessment of breast lump. J Coll Physcians Surg Pak 2007;17:535–8.
16. Jayaram G, Gupta M. Fine needle aspiration cytology of benign breast lumps: a review of experience with 651 cases. Malaysian J Pathol 1994;16(1):29–38.
17. Zuk JA, Maudsley G, Zakhour HD. Rapid reporting on fine needle aspiration of breast lumps in out patients. J Clin Pathol 1989;42:906–11.
18. Ariga R, Bloom K, Reddy VB, Kluskens L, francescath D, Dowlat K, *et al*. Fine needle aspiration of clinically suspicious palpable breast masses with histopathologic correlation. Ann J Surg 2002;184:410–3.
19. Boerner S, Fornage BD, Singletary E, Sneige N. Ultrasound guided fine needle aspiration of non-palpable breast lesion; a review of 1,885 FNA cases using the national cancer institute supported recommendation on the uniform approach to breast FNA. Cancer 1999;87:19–24.

Address for Correspondence:

Dr. Shagufta Nasir Pervaiz, Pathology Department, Hayatabad Medical Complex, Peshawar, Pakistan. **Cell:** +92-333-9143567
Email: shaguftapervez_3@yahoo.com