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Original Research Article

Cytology and Histopathology Correlation of Breast Lesions

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Abstract

Benign breast diseases are common in young females in the second and third decade of life. Most common presentation is painless lump in the breast. Clinical and cytological correlation is essential for definitive diagnosis and early treatment of the lesions. Fine Needle Aspiration Cytology (FNAC) is a popular technique utilized in the diagnosis of palpable masses anywhere in the body, it is sensitive and specific, expedient, economical and safe and less time consuming without much discomfort to the patient. The aim of this study is to analyze and correlate the diagnosis of breast lesions on cytology with histopathology. This is a retrospective cum prospective study which includes 468 cases of palpable breast masses. The chief complaint was lump in the breast, pain in the breast and/or discharge from the nipple. Patients' ultrasound findings were noted. FNAC was performed by using 23 gauge needle attached to 5 ml or 10ml disposable syringe. For histopathological examination tissue was grossed and representative areas were taken and processed for slide preparation and staining. Slides were examined under light microscope and the findings were correlated with FNAC findings. The study included 468 breast masses / cases, which were diagnosed on cytology. Most of the cases in this study were in the age group 20- 29 years (157 cases). The size of the lesion varied from 1.0 cm to 7.6 cm in the largest plane, number of swellings in a single breast varied from one to eight. Largest numbers of multiple fibroadenomas (both breast) were 16 of varying sizes. Most of the lesions were noted in the left breast than right breast. The accuracy of the FNAC is 97.88 % in this study.

Keywords: Fine Needle Aspiration Cytology (FNAC), Benign, Malignant, Carcinoma, Fibroadenoma.

INTRODUCTION

Breast is an essential organ of the female reproductive system. Histologically breast is made of both epithelial and connective tissue components. Breast lesions are a common heterogeneous group of disorders ranging from self limiting inflammatory lesions to life threatening invasive cancers [1]. Breast diseases are showing a rising trend worldwide and this may be due to increasing public awareness of breast cancer due various media, advertisements and articles. Breast cancer is presently the most common female malignancy worldwide [2, 3]. Breast lesions are relatively common in younger population and the incidence rises during the second decade of life and peaks in the fourth and fifth decades. In contrast, the malignant diseases are more common after menopause [4, 5]. Benign processes may be completely asymptomatic or have a variety of clinical manifestations, such as palpable nodularity, thickening, mass, pain, inflammation, or nipple discharge. Malignant lesions presents with lump with pain, skin changes, edema, nipple discharge and nipple retraction. Many of the signs and symptoms encountered in various breast diseases are nonspecific and require further evaluation by means of imaging and sometimes followed by biopsy study for definitive diagnosis. FNAC is a popular technique utilized in the diagnosis of palpable masses anywhere in the body, it is sensitive and specific, expedient, economical and safe and less time consuming without much discomfort to the patient. In breast masses, FNAC is commonly used as a part of diagnostic triad in addition to clinical breast examination and mammography. In cases where FNAC does not give definitive diagnosis, surgical excision of the breast lump is done and subjected to histopathological examination (HPE) for definitive diagnosis.

Aim of the study

The aim of this study is to analyze and correlate the diagnosis of breast lesions on cytology with histopathology.

MATERIALS AND METHODS

This is a retrospective cum prospective study which includes 468 cases of palpable breast masses. This study was done between July 2010 to December 2012 at Gandhi Medical College, Secunderabad,

Telangana state (TS), India. Patients and patient's attendees were explained about the FNAC procedure and detailed family history was taken before the start of procedure. Local examination of the breast was done in the presence of a female attendee and a female technician. The ages of the patients in this study were between 10-79 years. The chief complaint was lump in the breast, pain in the breast and/or discharge from the nipple. Patients' ultrasound findings were noted. FNAC was performed by using 23 gauge needle attached to 5 ml or 10ml disposable syringe. Slides were immediately fixed in ethyl alcohol and stained by Hematoxylin and Eosin (H & E) and Giemsa. If fluid is aspirated then it is centrifuged and the sediment is then smeared on the slides and was stained by H &E stain. Following staining of the smear they were examined under light microscope, observations were made and recorded. The cytological smears were broadly classified using the classification by Gershergorn *et al.*, as Acellular smears, Inflammatory, Benign and Malignant smears. FNAC was followed by either biopsy or excision. The tissue obtained was fixed, processed and stained by H&E technique, followed by microscopic or histopathology examination. For Histopathological examination, tissue was left overnight in a container with 10% buffered formalin. The tissue was grossed and representative areas were taken and processed for slide preparation and staining. Slides were examined under light microscope and the findings were correlated with FNAC findings and reports were issued to the concerned patients.

RESULTS

The study included 468 breast masses / cases, which were diagnosed on cytology. The age group included in this study was between 10 years and 79 years. Most of the cases in this study were in the age group 20- 29 years (157 cases) followed by 30- 39 years group(83 cases) and least numbers of cases were in age group 70-79 years (09 cases) (Table-1). The size of the lesion varied from 1.0 cm to 7.6 cm in the largest plane, number of swellings in a single breast varied from one to eight. Largest numbers of multiple fibroadenomas (both breast) were 16 of varying sizes. Most of the lesions were noted in the left breast than right breast.

Table-1: Age Wise Distribution of Cases

Age group	Number of cases	Percentage
10-19 years	79	16.88 %
20-29 years	157	33.55 %
30-39 years	83	17.74 %
40-49 years	54	11.54 %
50-59 years	47	10.05 %
60-69 years	39	08.32 %
70-79 years	09	01.92 %
total	**468**	**100**

In this study, most common diagnosis was Fibroadenoma and its variants like juvenile fibroadenoma, giant fibroadenoma and multiple juvenile fibroadenoma (Total 308 cases) and least common diagnosis given on cytological examination was tuberculous mastitis (04 cases). Various cytology diagnoses are listed in Table-2.

Table-2: Cytological Diagnoses of Various Breast Lesions

Cytological diagnosis	Number of cases	Percentage
Fibroadenoma	308	65.82 %
Juvenile fibroadenoma		
Multiple juvenile fibroadenomas		
Giant fibroadenoma		
Carcinoma breast	63	13.46 %
Proliferative breast disease	24	05.13 %
Fibrocystic disease of breast	19	04.05 %
Benign cystic lesions	17	03.63 %
Phyllodes tumor	13	02.78 %
Non specific mastitis	11	02.35 %
Granulomatous mastitis	09	01.93 %
Tuberculous mastitis	04	00.85 %
Total	468	100 %

In this study, overall 405 lesions/cases were benign and only 63 cases were malignant. Out of the 405 cases reported as benign 7 cases turned out to be malignant on histopathology and these three cases were

given as proliferative breast disease on cytology. There were 3 cases which were reported as malignant but on histopathology they turned out to be non-malignant/ benign. Out of the 308 fibroadenoma cases reported, 3 cases turned out to be tubular adenoma. Thus, the discrepancy in this study was only for 10 cases which were under diagnosed and over diagnosed. The accuracy of the FNAC is 97.88 % in this study. Cytological and histopathological correlation is tabulated in Table-3.

Table-3: Histopathological Correlation Of Cases Diagnosed On Cytology

Breast lesion	Cytology	Histopathology examination (HPE)
Fibroadenoma	308	305
Tubular adenoma	000	003
Carcinoma breast	63	70
Proliferative breast disease	24	17
Fibrocystic disease of breast	19	19
Benign cystic lesions	17	17
Phyllodes tumor	13	13
Non specific mastitis	11	11
Granulomatous mastitis	09	09
Tuberculous mastitis	04	04
Total	468	468

Among the 70 cases of carcinoma reported on histopathology, majority of the carcinomas were Infiltrating duct cell carcinoma, non-specific type (NST) (88.5 %, 62 cases) and remaining 8 cases were Medullary carcinoma (2 cases), Tubular carcinoma (1 case), Papillary carcinoma (1 case), Invasive Micro papillary carcinoma (1 case), Mucinous carcinoma (1 case), Cribriform carcinoma (1 case) and Lobular Carcinoma (1 case).

DISCUSSION

The present study included total 468 cases of benign breast lesions where the clinical findings were correlated with cytological, histopathological and radiological findings.

The majority of cases (33.55%) in our study were encountered in the age group of 20-29 years and the least commonly affected age was above 70 years which is in correlation with the studies conducted by Ilaiah *et al*., (n=60 cases) have also observed in a similar study that 58.3% of their cases of benign breast lesions were in the 21-30 years age group [6] and Chalya *et al*., in their study on benign breast lesions (n=346 cases), with a patient age range from 14 to 72 years observed a median age of 26 years and 69.9% of their cases fell in the 21-30 years age group [7]. In a recent study conducted by Koorapati R *et al.*, 60 % of the cases were in the age group of 21-30 years which is in correlation with this study [8]. In our study, there were only 16.88% cases in the 10-19 years age, whereas, Ilaiah *et al*., and Mallikarjuna *et al*., reported higher values of 23.3% and 40% for this age group respectively [6]. On contrary, a study by Koorapati R *et al*., reported only 8 % in the age group of 10-19 years [8].

In this study, 86.5 % of the lesions were benign on cytology and histopathology which is in correlation with the study conducted by Abdul Rasheed et al where 80.70% benign lesions of various etiology and 22.2% of malignant lesions were reported [9]. In other study, Malik [10] in his study of 1724 cases over a period of 20 years reported benign lesions in 72.97% and malignant lesions in 27.3% of cases. Similar results were obtained by Iyer *et al.,* in 2000 [11] and Mayun *et al.,* in 2008 [12].

Laterality of the lesions in this study was towards the left breast, which is on contrary to the studies done by Koorapati R *et al*., and Chalya *et al*., where right breast was most commonly involved [7, 8]. Bilateralism was seen in around 7.2% of the cases which is in tandem with the study by Sangma *et al*., [13]. In the present study, the sensitivity for detecting most common breast lesion fibroadenoma was 97.88 % which is in correlation with the studies conducted by Koorapati R *et al*., Furnival *et al*., and Dandapet *et al*., [8, 14, 15].

Lump in the breast was the most common presenting symptom in both benign and malignant groups followed by pain in the benign group and in the malignant group which is in correlation with Dixon et al, Griffith et al and other studies [16, 17].

In the present study, cyto-histological correlation was 98 % which is in tandem with the study conducted by Yalavarthi S *et al*., where 73.68% for fibroadenoma, 42.85% for fibrocystic disease [18].

Benign breast diseases are common among 21-30 years. Common clinical presentation is that of a painless mobile breast lump. Breast pain and nipple discharge are the other symptoms. Fibroadenoma is the commonest in our study. Clinical diagnosis was correlated with cytology and histopathology

CONCLUSION

FNAC of breast lumps is an accepted and established method for determining the benign or malignant nature of various breast lumps with a high degree of accuracy. This allows better investigation and wiser preoperative decision than was possible when excision biopsy and frozen section confirmed the clinical diagnosis. The present study confirms the accuracy and clinical utility of FNAC in the investigation of the patient with benign and malignant breast disease. Early screening and diagnosis of breast lesions and categorization into different groups of breast pathology can be helpful in accurate management of the breast lesions.

REFERENCES

1. Guray, M., & Sahin, A. A. (2006). Benign breast diseases: classification, diagnosis, and management. *The oncologist*, *11*(5), 435-449.
2. Mahboubi, E. (1987). Epidemiology of cancer in Saudi Arabia, 1975-1985. *Epidemiology*, *7*(4), 265-266.
3. Parkin, D. M., Bray, F., Ferlay, J., & Pisani, P. (2005). Global cancer statistics, 2002. *CA: a cancer journal for clinicians*, *55*(2), 74-108.
4. La Vecchia, C., Parazzini, F., Franceschi, S., & Decarli, A. (1985). Risk factors for benign breast disease and their relation with breast cancer risk. Pooled information from epidemiologic studies. *Tumori Journal*, *71*(2), 167-178.
5. Caleffi, M., Duarte Filho, D., Borghetti, K., Graudenz, M., Littrup, P. J., Freeman-Gibb, L. A., ... & Smith, J. S. (2004). Cryoablation of benign breast tumors: evolution of technique and technology. *The breast*, *13*(5), 397-407.
6. Ilaiah, M., Purnaiah, M., & Pasha, M. (2015). Evaluation of Benign Breast Diseases with Clinico, Pathological and Radiological Correlation. *Indian J Appl Res*, 5(11).
7. Chalya, P. L., Manyama, M., Rambau, P. F., Kapesa, A., Ngallaba, S. E., Masalu, N., & Mabula, J. B. (2016). Clinicopathological pattern of benign breast diseases among female patients at a tertiary health institution in Tanzania. *Tanzania Journal of Health Research*, *18*(1).
8. Ramesh, K., & Bookya, K. (2017). A study on clinical and pathological correlation of benign breast lesions. *International Surgery Journal*, *4*(8), 2700-2705.
9. Rasheed, A., Sharma, S., Mohsin-ul-Rasool, B. S., Hafiz, A., & Bashir, N. (2014). A three year study of breast lesions in women aged 15-70 years in a tertiary care hospital. *Sch J App Med Sci*, *2*, 166-68.
10. Iyer, S. P., & Gore, M. A. (2000). Epidemiology of benign breast diseases in females of childbearing age group. *Bombay Hosp J*, *42*(10), 141-146.
11. Mayun, A. A., Pindiga, U. H., & Babayo, U. D. (2008). Pattern of histopathological diagnosis of breast lesions in Gombe, Nigeria. *Nigerian Journal of Medicine*, *17*(2), 159-162.
12. Bauer, B. S., Jones, K. M., & Talbot, C. W. (1987). Mammary masses in the adolescent female. *Surgery, gynecology & obstetrics*, *165*(1), 63-65.
13. Sangma, M. B. M., Panda, K., & Dasiah, S. (2013). A clinico-pathological study on benign breast diseases. *Journal of clinical and diagnostic research: JCDR*, *7*(3), 503-506.
14. Dandapat, M. C., & Panda, B. K. (1986). Fine needle aspiration as a primary adjunct in diagnosis of palpable breast lumps. *Journal of the Indian Medical Association*, *84*(1), 3-6.
15. Furnival, C. M., Hocking, M. A., Hughes, H. E., Reid, M. M. W., & Blumgart, L. H. (1975). Aspiration cytology in breast cancer its relevance to diagnosis. *The Lancet*, *306*(7932), 446-449.
16. Dixon, J. M., & Mansel, R. E. (1994). ABC of breast diseases. Symptoms assessment and guidelines for referral. *BMJ: British Medical Journal*, *309*(6956), 722-726.
17. Griffith, C. D. M. (1998). Benign breast disease. In Sengupta BS, Chattopadhyay SK, Varma TR editors; Gynaecology for post graduates and practitioners. New Delhi: BI Publications, 464-475.
18. Yalavarthi, S., Tanikella, R., Prabhala, S., & Tallam, U. S. (2014). Histopathological and cytological correlation of tumors of breast. *Medical Journal of Dr. DY Patil University*, *7*(3), 326.