Original Research Article

Diagnostic correlation of palpable breast masses by cytology and histopathology: A prospective study

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Abstract

Introduction: Fine needle aspiration cytology (FNAC) has revolutionized the approach to diagnosis and management of breast and various other lesions. Its accuracy in many situations avoids any unnecessary surgical procedures. The aim of this study was to analyze and correlate the diagnosis of breast lesions on cytology with histopathology.

Materials and methods: This prospective study was done at Government Medical College, Nizamabad, and Telangana State (TS) during June 2016 to May 2018 and total numbers of cases included were 200. A detail clinical and family history was taken before the procedure of FNAC and examination of both the breast was done.

Results: The study included 200 breast masses/ cases, which were diagnosed on cytology. The age group included in this study was between 16 years and 75 years. Most of the cases in this study were in the age group 16- 30 years (91 cases) followed by 31- 45 years group (66 cases), followed by 46-60 years (34 cases) and least numbers of cases were noted in 61-75 years age group (09 cases). In this study, most common diagnosis was Fibroadenoma and least common diagnosis given on cytological examination was tubular Adenoma.

Conclusion: FNAC is an important diagnostic adjunct in the management of patient with a breast lump. Recently FNAC popularity has grown many folds and has become a most valuable tool in the diagnosis of palpable breast masses owing to its distinct advantages of being sensitive, specific, expedient, economical and safe. Lack of local or general anesthesia makes the procedure more comfortable for the patient and the pathologist.

Key words

Fine needle aspiration cytology (FNAC), Benign, Malignant, Fibroadenoma, Ductal carcinoma, Tubular adenoma.

Introduction

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. FNAC procedure was first introduced by Martin and Ellis for a palpable breast masses in 1930 and since then it has been established as an important tool in the evaluation of breast lesions [1]. Many countries have breast cancer screening programs aimed at detecting early disease in asymptomatic women. The diagnostic process involves the "Triple test" consisting of clinical examination, mammography and FNAC [2]. The main aim of FNAC is to separate malignant lesions that require more radical therapy from benign ones that may be conservatively managed [3]. There are various categories of breast lesions depending on risk of development of cancer. Inflammatory breast disease and non proliferative breast disease do not increase the risk of cancer. Proliferative breast disease without atypia and with atypia confers mild and moderate risk respectively, whereas carcinoma in situ is associated with high risk [4]. 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 very difficult to determine whether a breast lump is benign or malignant only by clinical assessment [5]. FNAC could provide a diagnosis with only 10-30% of the cost of surgical biopsy [6]. This study intended to look at the distribution of benign lesions in breast using FNAC with histopathological correlation to assess the diagnostic accuracy.

Aim of the study

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

Materials and methods

This was a prospective study which includes 200 cases of palpable breast masses. This study was done between June 2016 to May 2018 at Government Medical College, Nizamabad and Telangana state (TS). Patients were explained about the procedure and detailed family history was taken before the procedure. Local examination of the breast was done in the presence of a female attendee and a female technician. The ages of the patients were between 16-75 years. The chief complaint with which all the patients was lump in the breast swelling, pain in the breast and/or discharge from the nipple. FNAC was performed by using 23 gauge needle attached to 5 ml or 10 ml disposable syringe. Slides were immediately fixed in ethyl alcohol fixative and stained by Hematoxylin and eosin (H & E) and Giemsa. If fluid was aspirated then it was centrifuged and the sediment was 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 (**Figure – 1, 2**).

Results

The study included 200 breast masses / cases, which were diagnosed on cytology. The age group included in this study was between 16 years and 75 years. Most of the cases in this

study were in the age group 16- 30 years (91 cases) followed by 31- 45 years group (66 cases), followed by 46-60 years (34 cases) and least numbers of cases were noted in 61 – 75 years age group (09 cases) (**Table - 1**). The size of the lesion varied from 1.5 cm to 6.5 cm in the largest plane.

Table - 1: Age wise distribution of cases.

Age group (Years)	No. of cases	%
16-30 years	91 cases	45.5 %
31-45 years	66 cases	33 %
46-60 years	34 cases	17 %
61-75 years	09 cases	4.5 %
	Total = 200	

Table - 2: Cytological diagnoses of various breast lesions.

Cytological diagnosis	No. of cases	%
Fibroadenoma	104	52 %
Fibrocystic disease of breast	15	7.5 %
Proliferative breast disease	13	6.50%
Benign cysts	11	5.5 %
Carcinoma breast	39	19.5 %
Granulomatous mastitis	08	4.0 %
Non-specific mastitis	05	2.5 %
Tuberculous mastitis	03	1.5 %
Tubular adenoma	02	1.0 %
Total	200	

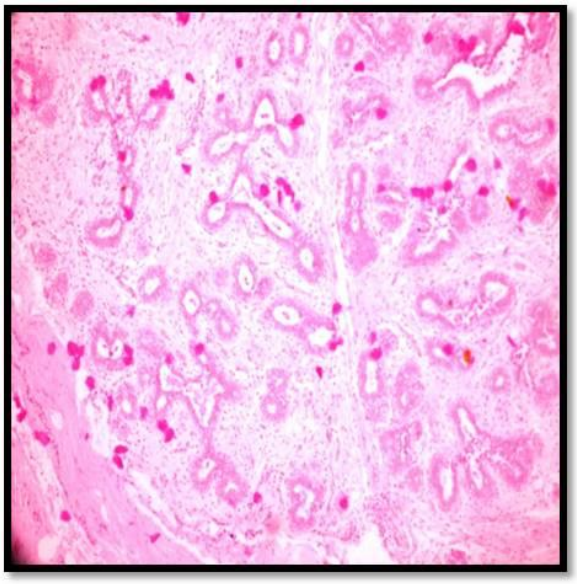
In this study, most common diagnosis was Fibroadenoma and least common diagnosis given on cytological examination was tubular Adenoma. Various cytology diagnoses are listed in **Table - 2**.

In this study, based on cytology only 39 cases were malignant and remaining 161 cases were benign. Out of the 161 cases, 3 cases turned out to be malignant on histopathology and these three cases were given as fibroadenoma on cytology. Total 8 cases were diagnosed as granulomatous mastitis on cytology which turned out to be phyllodes on histopathology. The accuracy of the FNAC was 98.1% in this study. Cytological and histopathological correlation is tabulated in **Table - 3**.

Table - 3: Histopathological correlation of cases diagnosed as benign on cytology.

Breast lesion	Cytology	Histopathology examination (HPE)
Fibroadenoma	104	101
Fibrocystic disease of breast	15	15
Proliferative breast disease	13	13
Benign cysts	11	11
Carcinoma breast	39	42
Granulomatous mastitis	08	04
Non-specific mastitis	05	05
Tuberculous mastitis	03	03
Tubular adenoma	02	02
Phyllodes tumor	00	04
Total	200	200

Figure - 1: Histopathology Image of Fibroadenoma.



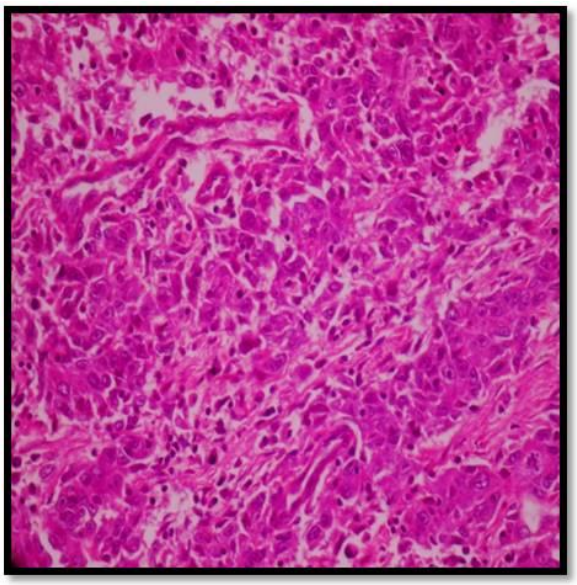
Discussion

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 [7, 8]. 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. Akçil, et al. in his meta-analysis noted 72%–95% diagnostic accuracy on review of literature. Our study showed slightly higher accuracy than the range reported [9]. Various other studies have shown even higher rate of accuracy in diagnosing the breast lesions. In this study, we have come across some false negative results such as fibroadenoma in middle age females which were turned out to be infiltrating duct cell carcinomas on histopathology. The possible reasons could be early presentation with small sized tumor, inadequate sampling and hypocellularity during aspirations, problems with interpretation considering age factor, cellularity and other histological subtypes such as scirrhous tumors [10]. The accuracy of FNAC for obtaining a definite diagnosis also depends on the palpability of the lesion. Accuracy rate reported for FNAC is 34–58% for non-palpable breast lesions, whereas accuracy rate for core needle biopsy is 94% [11, 12]. FNAC has some pitfalls in the diagnosis of fibrocystic disease, adenosis, and epithelial hyperplasia with or without atypia, apocrine metaplasia, radial scar, and papilloma, which may have to be correlated with imaging studies to rule out malignancy [13].

Our study is in correlation with the study conducted by Yalavarthi S, et al. [14], where the study showed the age of the patients ranged from 10 to 80 years. The oldest case (80 years) was diagnosed as proliferative lesion with atypia and youngest (10 years) was a juvenile fibroadenoma. Most of the cases were in the 3rd decade of life whereas in our study most of the cases were in the age group of 16-30 years. In a series of 125 aspirations by Ishita, et al., maximum benign lesions (40%) were reported in the third decade, while only 4% of the malignant lesions were reported in this age group. Maximum malignant lesions (56%) were reported in the fifth decade [15]. Pinto, et al. had a range of 12-82 years. The oldest case was diagnosed (82 years) as breast abscess and the youngest (12 years) was a benign phyllodes tumor [16].

Figure 2: Histopathology Image of Ductal Carcinoma of the breast.



Various authors proposed different reporting protocols in classifying the breast lesions. Feichter analyzed 1472 aspirations and classified the lesions into four categories; benign, suspicious, malignant and inadequate [17]. Ishita, et al. classified the lesions into four diagnostic classes i.e. benign, malignant, suspicious, inadequate [15]. In this study, the lesions were divided into four categories. They are benign, malignant, proliferative/suspicious and inadequate. In terms of cytological diagnoses, our study is in correlation with the study done by pinto et al where fibroadenoma was the commonest lesion followed by fibrocystic disease. Among malignant lesions, infiltrating duct cell carcinoma was the most common lesion according to the various studies and this study coincided with the many authors [15, 16, 18, 19].

In the present study, cyto-histological correlation was 93% which is in comparison with the study

conducted by Yalavarthi S, et al. [14] where 73.68% for fibroadenoma, 42.85% for fibrocystic disease. Out of 19 cases of fibroadenoma, 14 were diagnosed histologically also as fibroadenoma, three as fibrocystic diseases, one case was fibroadenosis and one was phyllodes tumor. Out of seven case of fibrocystic disease, three diagnosed as fibroadenoma, one case was phyllodes tumor histologically. One case of phyllodes tumor was reported in the sixth decade, but it was not followed-up. In this study, cyto-histological correlation was more than 95 % for malignant lesions.

Ishita, et al. [15] performed 125 FNACs of breast over a period of 1 year. Of these 60 cases were followed-up by histopathological confirmation. The diagnostic accuracy of this series was assessed. The sensitivity of the FNA procedure was 93.10%, specificity 97.06%, with a positive predictive value 96.43%. The overall diagnostic accuracy was 95.24%. In the present study our sensitivity, specificity and positive predictive value were still higher when compared.

Conclusion

FNAC is an important diagnostic adjunct in the management of patient with a breast lump. Recently FNAC popularity has grown many folds and has become a most valuable tool in the diagnosis of palpable breast masses owing to its distinct advantages of being sensitive, specific, expedient, economical and safe. Lack of local or general anesthesia makes the procedure more comfortable for the patient and the pathologist. It greatly compliments the clinical and radiological examination and permits rapid diagnosis in more than 95% of the cases.

Thus it is commonly used as a part of diagnostic triad in case of breast lump, which in addition to FNAC includes clinical breast examination and mammography.

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