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A prospective study of pattern and accuracy of FNAC in benign breast diseases

Dr. Harshitha C[1], Dr. Sathyavathi R Alva[2]
[1] Post Graduate, Department of Pathology, KVG Medical College and Hospital, Sullia, Karnataka, India
[2] Professor and HOD, Department of Pathology, KVG Medical College and Hospital, Sullia, Karnataka, India

Abstract
Introduction: FNAC is a widely practiced and widely accepted technique for the early evaluation of breast lumps. It is a minimally invasive, simple and cost effective procedure [1, 5].
Aim: The main aim of this study is to evaluate the efficacy of FNAC in benign breast lesions in correlation with histopathological diagnosis.
Materials and Methods: This study is a prospective study conducted over a period of 1 year from June 2018 to June 2019.A total of 100 cases of benign breast lumps for which FNAC was done with histopathological follow up wherever possible.
Results: Benign breast lesions were commonly found in the age group of 21-30 years and the commonest lesion encountered in our study was fibroadenoma.
The diagnostic accuracy of FNAC in benign breast disease is found to be 84%.
Conclusion: FNAC is highly specific and sensitive technique for the initial management of breast lesions with high accuracy rate.

Keywords: FNAC, histopathology, fibroadenoma, benign breast lesions, diagnostic accuracy

Introduction
Benign breast lesions has become the common health issue among female population. Benign breast disease in females is very gripping as it has wide varieties and presentations and also causes anxiety of malignancy to the patient. With variants in occurrence and presentation in different age groups it creates a challenge to study the pattern of disease, histological variants of various types of benign breast diseases [11]. Fine needle aspiration cytology is an extensively accepted method for the early evaluation of the breast lesions. It's a simple, rapid and safe method having high sensitivity and specificity [1], The majority of the lesions that occur in the breast are benign. Benign breast lesions comprehend a heterogeneous group of lesions that may present with a variety of symptoms. Commonly seen benign breast lesions are inflammatory lesions, epithelial and stromal proliferative lesions and neoplasms. The incidence of benign breast diseases begins to rise in the second decade and peaks in the fourth and fifth decade of life [13].
This study was aimed to understand the patterns of benign breast lesions and to know the accuracy of fnac in diagnosis of the benign breast disease by correlating with the histopathology wherever possible.

Materials and Methods
This is a prospective study undertaken in the Department of Pathology at KVG medical college for a period of 1 years from June 2018 to June 2019.

Inclusion criteria
Patients with clinically suspected benign breast lumps were included in the study.

Exclusion criteria
Breast lumps suspicious of malignancy clinically or diagnosed radiologically were excluded from the study.
A total of 100 patients with benign breast lesions were included in the study and were subjected to FNAC by taking prior consent of the patient. The detailed clinical history was taken and the patient was examined before the procedure. Under as ceptic precautions the FNA was done using FNAC gun along with disposable 10cc syringe and 22 gauze needle. The smears were stained with leish man and H&E stain.
The lumpectomy specimens were received in 10% formalin and allowed to fix for 24 hours. The specimens were grossed and processed. The sections from paraffin blocks were cut at 5 µm thickness, stained with hematoxylin and eosin and studied under the microscope.
Results of FNAC were compared with histopathological diagnosis. Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of FNAC in each lesion was calculated. The diagnostic accuracy of FNAC was calculated by correlating with histopathological results.

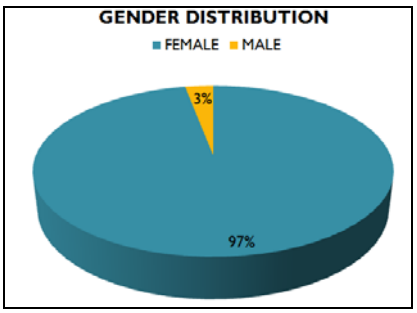

Fig 1

Table 1: Fine needle Aspiration diagnosis of 100 benign breast disease

	No of cases	percentage
1. Fibroadenoma	39	39%
2.Fibrocystic disease	28	28%
3.Simple cyst	09	09%
4.Benign phyllodes	06	06%
5.Sub areolar abscess	04	04%
6.Acute mastitis	04	04%
7.Gynecomastia	03	03%
8.Benign breast disease	03	03%
9.Chronic mastitis	02	02%
10.Lactational changes	01	01%
11.Granulomatous mastitis	01	01%
	100	

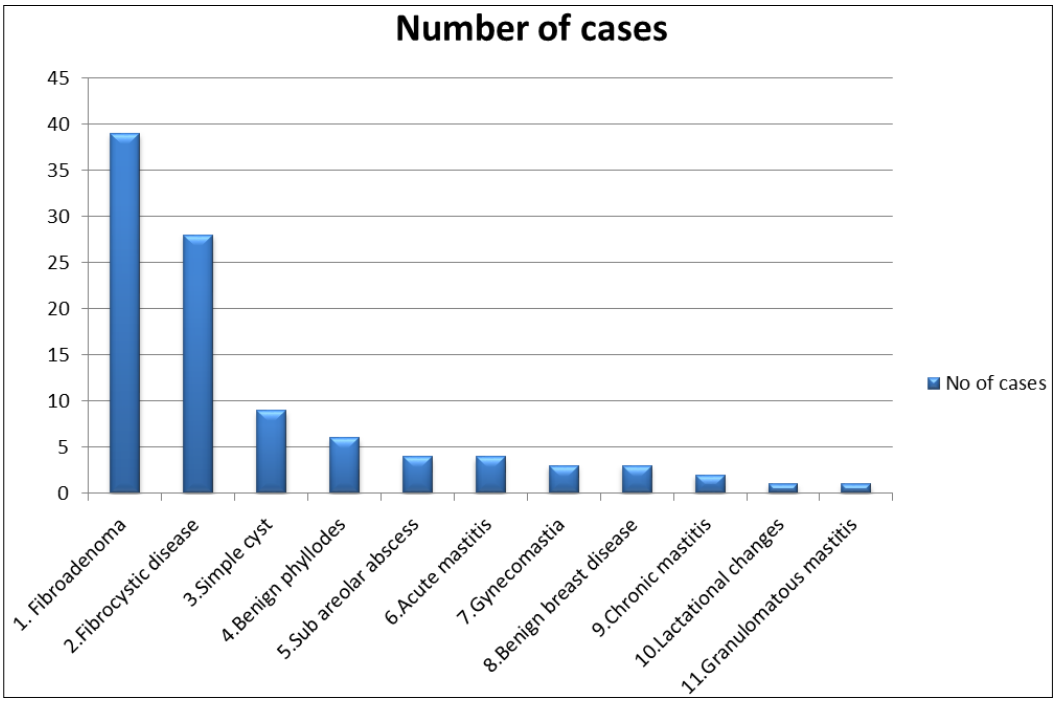

Fig 2

Table 2: Age wise distribution of cases

	FA	FCD	SC	B P	SAA	AM	GYM	BBD	CM	LC	GM	TOTAL
1-10	00	00	00	00	00	00	00	00	00	00	00	00
11-20	04	01	00	02	00	00	00	00	00	00	00	07
21-30	26	20	03	01	00	01	02	02	00	01	00	56
31-40	05	05	01	03	00	01	01	01	00	00	01	18
41-50	04	02	04	00	02	02	00	00	02	00	00	16
51-60	00	00	01	00	02	00	00	00	00	00	00	03
61-70	00	00	00	00	00	00	00	00	00	00	00	00
	39	28	09	06	04	04	03	03	02	01	01	

Key: FA- Fibroadenoma, FCD- Fibrocystic disease, SC- Simple cyst, BP- Benign phyllodes, SAA- Subareolar abscess, AM-Acute mastitis, GYM-Gynecomastia, BBD- Benign breast disease, CM- Chronic mastistis, LC- Lactational changes, GM- Granulomatous mastitis.

Table 3: Cytomorpho logical features of breast lesions

Diagnosis	No of cases	Ductal epithelial cells	Apocrine cells	Bare bipolar nuclei	Cyst macrophages	Stromal fragments	Fibromyxoid stroma
Fibroadenoma	39	39	05	38	07	30	36
Fibrocystic disease	28	25	25	20	26	12	
Simple cyst	09	-	03	-	09	-	
Gynecomastia	03	03	-	03	-	-	

Table 4: Inflammatory lesions

Diagnosis	No of cases	Epthelioid granulomas	Giant cells	Inflammatory cells	Necrotic debris
Acute mastitis	4	-	01	04	03
Subareolar abscess	4	-	-	04	03
Granulomatous mastitis	1	01	01	01	

Table 5: Available Histopathological diagnosis of patients with benign breast disease.

	No of cases (Histo Path)	No of cases(FNAC)
Fibroadenoma	19	19
Fibrocystic breast disease	15	17
Benign phyllodes	03	02
Gynecomastia	02	02
Lactational Adenoma	01	
	40	

Table 6: Cytological and histopathological correlation

FNAC diagnosed		Histopath diagnosed			
	Fibroadenoma	Fibrocystic disease	Benign phyllodes	Gynecomastia	Lactational adenoma
Fibroaden ma (19)	17	01	01	00	00
Fibrocystic disease(17)	02	14	01	00	00
Benign phyllodes(2)	00	00	01	00	01

Statiscial Analysis

Statistical analysis was done on the basis of the objectives stated. Data was collected and entered in Microsoft excel 2007 and analysis was done using SPSS version 20.

The data was analysed and tabulated as percentages. The sensitivity, specificity, positive predictive value and negative predictive value and overall accuracy of FNAC was calculated.

Table 7: Statistical results

	Sensitivity	Specificity	PPV	NPV
Fibroadenoma	89.4%	90.476%	89.47%	90.47%
Fibrocystic breast disease	93.33%	88%	82.35%	95.65%
Gynecomastia	100%	100%		

Results

In our study percentage of Benign breast lesions found in females and males is 97% and 3% respectively. [Picture 1]. The commonest age group was 21- 30 years with a total of 56 cases [Table 2]. The commonest lesion encountered was fibroadenoma (39%), followed by fibrocystic breast disease (28%). The least common lesions found were tubercular mastitis (1%) and lactational adenoma (1%) [Table 1]. Cytomorphological features of fibroadenoma, fibrocystic disease, simple cyst and gynecomastia are tabulated in Table 3 and features of inflammatory lesions such as acute mastitis, subareolar abscess and granulomatous mastitis are tabulated in Table 4.

Total of 40 specimens were obtained for histopathological examination in our department for the total of 100 FNA cases [Table 5].

Cytological diagnosis and histopathological diagnosis was correlated for fibroadenoma, fibrocystic breast disease and benign phyllodes [Table 6].

Statistical results are as follows [Table 7]. Sensitivity, specifivity, Positive predictive value and Negative predictive value of fnac for fibroadenoma is found to be 89.4%, 90.476%, 89.47% and 90.47% respectively. Gynecomastia is found to have highest sensitivity (100%) and specificity (100%).

The diagnostic accuracy of FNAC in benign breast lesions is found to be 84%.

Discussion

21-30 year is the commonest age group for benign breast lesions in our study. This is similar to the studies conducted by Chandanwale s *et al*, Arjun Singh *et al*, Shrestha s *et al* and shwetha p *et al*. [1,9, 10, 14]. In Jarwani pb *et al*'s study 31-40 yrs is the commonest age group for benign breast lesions[5].

Commonly encountered in female patients. In our study among 100 patients 97 were females and 3 were males. All three breast lesions in male in our study was diagnosed as gynecomastia. It was similar to Chandanwales *et al*[1] and Shwetha Pai's study[14].

Fibroadenoma is the commonest benign lesion encountered. It is supported by studies of Muddegowda PH *et al*, Shrestha s *et al* and shwetha pai's study. [2, 10, 14].

In our study, 19 benign breast lesions were diagnosed as fibroadenoma on fnac, on histopathological examination of the same, 2 cases were diagnosed as benign phyllodes and fibrocystic breast disease respectively. Among 17 FNA diagnosed cases of fibrocystic breast disease, on histopathological examination, 2 cases were diagnosed as fibroadenoma and 1 case was diagnosed as benign phyllodes. On FNA, 2 cases were diagnosed as benign Phyllodes, from which on histopathological examination one turned out to be lactational adenoma.

Diagnostic accuracy of FNAC of our study is found out to be 84%. It was concordant with the studies of Chandanwale s *et al* (86.66%) [1] and Jarwani pb *et al* (87.3%) [5]. Sharif a *et al*'s study showed 98.96% diagnostic accuracy [15]. Sensitivity, specifivity, Positive predictive value and Negative predictive value of fnac in fibroadenoma is found to be 89.4%, 90.476%, 89.47% and 90.47% respectively. It is similar to Chandanwales *et al*'s study. Gynecomastia is found to have highest sensitivity (100%) and specificity (100%). It's similar with. Chandanwale s1 *et al* and Das dk[4] *et al*'s study.

Conclusion

FNAC is an universally accepted minimally invasive technique in the initial evaluation of breast lesions. Which is safe, simple and relatively pain free procedure. FNAC is a highly cost effective and is highly specific and sensitive

technique in the preoperative diagnosis of breast lesions with high accuracy rate (84%).

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