

A Study to Evaluate the Role of FNAC in Diagnosis of Breast Lesions: A Hospital Based Study

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ABSTRACT

Background: Breast carcinoma is one of the dominant causes of malignancy in females. The conventional diagnostic mode of breast mass is excisional biopsy, which gives accurate diagnosis but may produce a benign pathological result in most cases. The purpose of this study is to evaluate and to check the accuracy of Fine-needle aspiration cytology in the diagnosis of palpable breast lumps.

Materials & Methods: This study was hospital based prospective study including all the patients with breast lump who attended hospital. Total 100 cases were taken out of which 80 cases had histological biopsies also. Comparison between cytology and histology was done according to availability of samples. A detailed history, general physical & local examination was performed of the patient.

Results: In the present study 100 Cases of breast lesion cytologically studied, out of which most common diagnosis was Carcinoma 45% (45 cases), followed by Fibroadenoma 24% (24 cases) along with Fibrocystic disease 11% (11 cases). Out of 100 cases were taken out of which 80 cases had histological biopsies, which most common diagnosis was Carcinoma 57.5% (46 cases), followed by Fibroadenoma 22.5% (18 cases) along with Fibrocystic disease 11.2% (9 cases). Major bulk 94 (94%) of cases revealed neoplastic in which 36 cases (36%) were benign and 58 cases (58%) were malignant. Therefore, the FNAC proved to be 91.25 % sensitivity in the

diagnosis of all breast lesions in our study. Overall false negative percentage was 9.5.

Conclusion: So we concluded that breast lesions are easily accessible to FNAC, which is an easy, cost effective and less time-consuming procedure. FNAC is used to diagnose both benign and malignant lesions. It is more sensitive and specific in diagnosing malignant lesions, showing 93.8 % sensitivity and 100% specificity.

Keywords: FNAC, Breast Carcinoma, Cytological, Histopathological.


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INTRODUCTION

Breast carcinoma is one of the dominant causes of malignancy in females. Diagnosis of breast carcinoma is usually made by fine needle aspiration biopsy. The diagnostic delay of breast cancer occur due to the generally low index of scepticism. The conventional diagnostic mode of breast mass is excisional biopsy, which gives accurate diagnosis but may produce a benign pathological result in most cases. The application of FNAC for the diagnosis of palpable breast masses was first introduced by Martin and Ellis in 1930 and since then has been orthodox as an important tool in the assessment of breast lesions.¹ The vast majority of the lesions that occur in the breast are benign. Much affect is given to malignant lesions of the breast because breast cancer is the most common malignancy in women in western countries; however benign lesions of the breast are more frequent than malignant ones.²

The scope of cytology now extends into identifying the subtypes of benign and malignant breast lesions. It is also used in the detection of minimal remaining disease for the purpose of planning a curative protocol and eventual follow-up. Thus, it plays a major role as an important preoperative evaluation procedure along with clinical correlation and imaging which are referred to as the "Triple test."

It is a minimally invasive yet maximally diagnostic method, often prevent an open biopsy. It is simple, fast, and can be performed as an OPD procedure, since it requires no special equipment, causes minimal morbidity, and has high patient acceptance. It is commonly used as part of the diagnostic triad, which in addition to the FNAC include clinical breast examination and mammography. The main purpose of Fine Needle Biopsy of breast lumps is to confirm cancer preoperatively and to avoid unnecessary surgery

in specific benign conditions.³ The purpose of this study is to evaluate and to check the accuracy of Fine-needle aspiration cytology in the diagnosis of palpable breast lumps.

MATERIALS & METHODS

This study was hospital based prospective study including all the patients with breast lump who attended hospital. Total 100 cases were taken out of which 80 cases had histological biopsies also. Comparison between cytology and histology was done according to availability of samples. A detailed history, general physical & local examination was performed of the patient. The palpable area was cleaned with cotton soaked antiseptic solutions. The patient was assisted to a supine position. The swelling was then fixed with one hand and with other hand a needle of gauze 22-25 attached to disposable syringe was inserted. Negative pressure was applied and the needle was then moved back and forth inside the swelling and then negative pressure was released while keeping the needle inside the target tissue.

Preparation of Smear

Needle was detached and aspirated material was expressed on glass slides. Smears were then prepared by single even movement by using flat surface of another glass slide.

Fixation

At least five to six smears were prepared from aspirated material. Two smears were immediately fixed in 95% ethyl alcohol for 15-20 min. and stained by Hematoxylin and Eosin. Two smears were air

dried to stain with May Grunwald Giemsa stain and other two smears were kept for special stains as per requirement.

Biopsy

Histopathological examination of the available biopsies was done for the study. The biopsy specimens were fixed in 10% formalin for 24 hours and then grossed and findings were noted. Paraffin embedded tissues were blocked in paraffin with the help of moulds. 4-6 μ thick sections were cut, these slides were kept in hot oven at 66°C for one hour to fix the section on slides and H&E staining was done.

RESULTS

In the present study 100 Cases of breast lesion cytologically studied, out of which most common diagnosis was Carcinoma 45% (45 cases), followed by Fibroadenoma 24% (24 cases) along with Fibrocystic disease 11% (11 cases) (table 1). Out of 100 cases were taken out of which 80 cases had histological biopsies, which most common diagnosis was Carcinoma 57.5% (46 cases), followed by Fibroadenoma 22.5% (18cases) along with Fibrocystic disease 11.2% (9 cases) (table 2). Major bulk 94 (94%) of cases revealed neoplastic in which 36 cases (36%) were benign and 58 cases (58%) were malignant (table 3). Cytological diagnosis was correlated with histopathology wherever possible and efficacy of FNAC was calculated (table 4). Therefore, the FNAC proved to be 91.25 % sensitivity in the diagnosis of all breast lesions in our study. Overall False negative percentage was 9.5 (table 5).

Table 1: Distribution of Cases according to cytological Diagnosis

Cytological Diagnosis	No. of Cases	Percentage
Mastitis	7	7.0%
Granulomatous Mastitis	2	2.0%
Fibroadenoma	24	24.0%
Fibrocystic disease	11	11.0%
Dyskaryotic changes	10	10.0%
Carcinoma	45	45.0%
Hypocellular	1	1.0%
Total	100	100.0

Table 2: Distribution of 80 Cases according to Histological Diagnosis

Histological Diagnosis	No. of Cases	Percentage
Mastitis	3	4
Granulomatous Mastitis	1	1.2
Tubercular Mastitis	1	1.2
Fibroadenoma	18	22.5
Fibrocystic disease	9	11.2
IDC	46	57.5
Mucinous Ca.	1	1.2
SCC	1	1.2
Total	80	100

Table 3: Distribution of Cases according to Nature of Lesions

Nature of Lesions	No. of Cases	Percentage
Nonneoplastic	6	6.0%
Benign	36	36.0%
Malignant	58	58.0%
Total	100	100.0

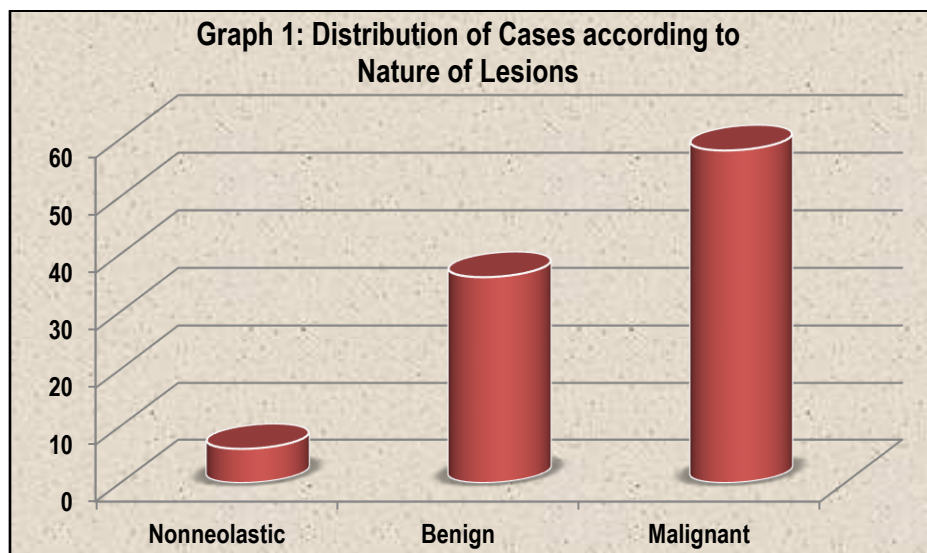


Table 4: Comparison of Cases of Cytological and Histological Diagnosis

		Cytological Diagnosis							TOTAL	
		Mastitis	Granulomatous Mastitis	Fibroadenoma	Fibrocystic disease	Dyskaryotic changes	Carcinoma	Hypocellular	No. of cases	%
		Cases	Cases	Cases	Cases	Cases	Cases	Cases		
Histological Diagnosis	Mastitis	3	0	0	0	0	0	0	3	3.75
	Granulo-matous Mastitis	0	1	0	0	0	0	0	1	1.25
	Tubercular Mastitis	0	1	0	0	0	0	0	1	1.25
	Fibro-adenoma	0	0	18	0	0	0	0	18	22.5
	Fibro-cystic disease	3	0	0	6	0	0	0	09	11.25
	IDC	0	0	0	2	7	36	1	46	57.5
	Mucinous Ca.	0	0	0	0	1	0	0	1	1.25
	SCC	0	0	0	0	1	0	0	1	1.25
Total	No. of cases	6	2	18	8	9	36	1	80	100
	%	7.5	2.5	22.5	10	11.25	45	1.25	100	

Table 5: Overall Statistical Analysis

Value	Formula	Percentage
Sensitivity	$TP(73)/TP(73)+FN(7)\times 100$	91.25
Positive predictive value	$TP(73)/TP(73)+FP(0)\times 100$	100
False negative percentage	$FN(7)/TP(73)+FN(0)\times 100$	9.5

Table 6: Diagnostic accuracy of FNAC in the diagnosis of palpable breast Lesions

Authors	Cases	Sensitivity	Specificity	PPV	NPV	Accuracy
Sneigeetal. (1993) ⁷	1995	96	99	99	94	97
Oneiletal. (1997) ⁸	697	97	78	92	92	-
Kimetal. (2000) ⁹	246	90.3	71.9	98.4	-	-
Mansoor et al. (2002) ¹⁰	72	98.4	60	93.9	93	-
Choi et al. (2004) ¹¹	1297	77.7	99.2	98.4	88	91.1
Present study (2016)	80	93.8	100	100	91.4	96.3

DISCUSSION

Breast disease is the most common disease in females. From puberty till death, the breast is subjected to physical and physiological alterations that are related to menstruation, pregnancy and menopause. Of all breast disorders, palpable breast lump is second most common presentation, pain being the first. The high frequency and the diverse variety of breast lesions has prompted many workers in various medical fields to embark upon numerous and exhaustive studies of many aspects of these disease conditions. Increasing awareness of breast cancer, the commonest female malignancy worldwide has stimulated profound interest in benign breast lesions since certain epithelial benign breast lesions have been associated with malignant transformation.⁶¹

Fine needle aspiration cytology (FNAC) has become an important preoperative and screening test for breast masses. The sensitivity and specificity of the procedure are extremely high when combined with clinical examination and imaging. The main objective of breast FNAC is to separate malignant lesions that require prompt surgical excision from benign ones.⁴ The breast lesions are easily accessible to FNAC, which is an easy, cost effective and less time-consuming procedure. FNAC is used to diagnose both palpable and non-palpable breast lesions, as well as to classify them into benign and malignant groups.⁵

In our study, out of 100 cases, 58 (58%) cases were showing malignancy and 42 cases (42%) were showing benign and nonneoplastic nature of lesions. Khanna R et al (1998)⁶ showed 61.3% benign and nonneoplastic nature of lesions and 38.7% malignancy. Malignant lesions were much higher in our study as cases were taken mainly from cancer lab. The frequency in which various lesions are encountered can be stated only in general terms, because it depends greatly upon clinical presentation. The prevalence of lesions also varies among age groups and among different ethnic population. Carcinoma of the breast is the most common malignancy in adult women and attention to it overshadows the attention to other breast lesions.

Probably cancerous tissues grow faster and produce more systemic and local manifestations. Hence patient with cancer are brought to hospital earlier, whereas, benign lesions are asymptomatic and slow growing and so are frequently neglected.⁶ Observations made in our study differ from other studies probably because of difference in sample collection from cancer lab, sample size and duration of study.

Most common nature of lesions were malignant 58 (58% confirmed cases) which includes Intraductal carcinoma (96.6%), Mucinous carcinoma 1 (1.7%), Squamous cell carcinoma 1 (1.7%). Benign lesions were 34 (34.7%) which include mainly fibroadenoma (64.7%) and fibrocystic disease 12 (35.3%). Nonneoplastic lesions were 6 (6.1%) including mastitis 4 cases and granulomatous mastitis 2 cases.

In the literature, the sensitivity ranges from 80 – 98% and the specificity may be upto 100%. Results of our study were comparable to above studies. High degree of sensitivity and specificity in this study may permit surgical management on pre operative cytological diagnosis.

CONCLUSION

So we concluded that breast lesions are easily accessible to FNAC, which is an easy, cost effective and less time-consuming procedure. FNAC is used to diagnose both benign and malignant lesions. It is more sensitive and specific in diagnosing malignant lesions, showing 93.8 % sensitivity and 100% specificity.

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