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Correlation of fine needle aspiration cytology and histopathology in palpable breast lesions in 100 patients of KVG Medical College & Hospital, Sullia, Karnataka

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Abstract

Breast carcinoma is one of the leading causes of malignancy in females. Diagnosis of breast carcinoma is often made by fine needle aspiration biopsy. The main purpose of fine needle biopsy of breast lumps is to confirm cancer preoperatively and to avoid unnecessary surgery in specific benign conditions.

Aims & Objectives

1. To diagnose any palpable breast lump in females by cytology.
2. To study the accuracy of FNAC (fine needle aspiration cytology) in diagnosing various breast lumps in females.
3. To confirm cytological diagnosis by doing histopathologic study in cases possible and obtain cytohistopathological correlation.

Materials & Methods: This study was conducted on all the patients referred to the Department of Pathology for FNAC and histopathological examination of palpable breast lumps in K.V.G Medical College and Hospital, Sullia 'between' September 2013 to October 2014. A FNAC was performed and cytological findings were recorded. After this, the patients were subjected to open/excision biopsy. Later diagnostic accuracy of cytology reporting was compared with that of histopathological study.

Results: We have accuracy of 100% for benign lesions and 95.45% for malignant lesions. The sensitivity for FNAC in diagnosing the palpable breast lump is 95.45%, specificity is 100%, positive predictive value is 100%, negative predictive value is 97.06% and diagnostic accuracy is 98.18%.

Conclusion: Fine-needle aspiration (FNA) cytology is a technique utilized in the diagnosis of palpable breast masses owing to its distinct advantages of being sensitive and specific, expedient, economical and safe.

Keywords: Fine needle aspiration cytology, sensitivity, specificity, diagnostic accuracy.

1. Introduction

Breast lumps are a fairly common presenting feature in our outpatient department, mostly benign and of no serious consequences but malignancy contribute a significant percentage of palpable lumps. There is an increasing awareness, and the associated anxiety and stress, particularly, among women who perceive every symptom in the breast as cancer, which compels the patient to seek medical advice.

Breast carcinoma is one of the leading causes of malignancy in females. The diagnosis is often made by fine needle aspiration biopsy. The application of FNA for the diagnosis of palpable breast masses was first introduced by Martin and Ellis in 1930. The main purpose of fine needle biopsy of breast lumps is to confirm cancer preoperatively and to avoid unnecessary surgery in specific benign conditions.

This study was undertaken to diagnose any palpable breast lump by cytology, to study the accuracy of FNAC in diagnosing various breast lumps and to confirm cytological diagnosis by doing histopathologic study in cases possible and obtain cytohistopathological correlation. Since the needle aspiration cytology was done for palpable tumor, ultrasound guidance was not followed.

1.1. Aims & objectives of the study

- To diagnose any palpable breast lump in females by cytology.
- To study the accuracy of FNAC in diagnosing various breast lumps in females.

- To confirm the cytological diagnosis by doing histopathologic study in cases possible and obtain the cytohistopathological correlation.

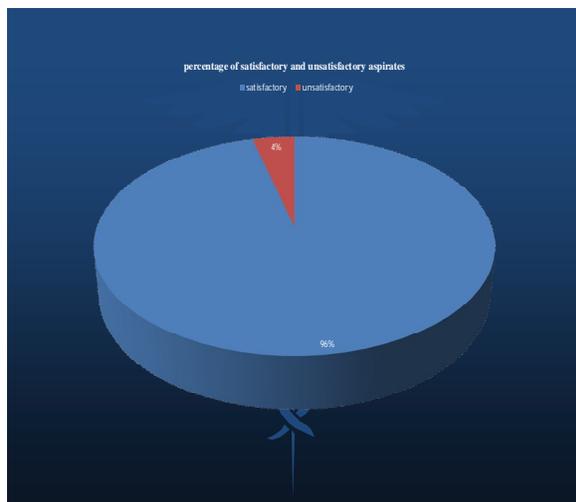
2. Materials & Methods

- Type of study** – prospective
- Source of data** – female patients with c/o palpable breast lump attending the surgery department
- Period of study** – 14 months
- Sample size** – 100 patients
- Inclusion criteria** -All female patients referred from Surgery Department
- Exclusion criteria**- 1.Non-palpable breast sample 2. Palpable breast masses in males
- FNA was performed using a 23- gauge needle after a thorough history taking and clinical examination of the mass. Aspirated material was expressed on to a glass slide and slide was immersed in a fixative 95% methyl alcohol .Slides were stained with hematoxylin & eosin and leishman’s stain.
- Final cytological report was described as malignant, suspicious, benign or unsatisfactory (inadequate) due to insufficient epithelial cells being present.

FNAC Categories	
Benign	There was no evidence of malignancy
Suspicious	Doubtful malignancy
Malignant	Cancer
Unsatisfactory	When there are too few cells, air-drying has occurred, or there was obscuring blood

3. Results

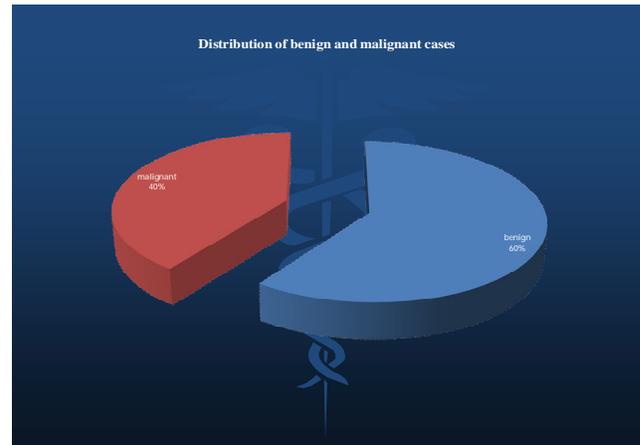
- Of these 100 aspirations, 4 turned out to be inadequate.
- The aspirates were considered to be inadequate if only fat and fibrous tissue were aspirated, without any cellular material, even after repeat aspiration.
- 4% of the aspirates were unsatisfactory and 96% were satisfactory.



- Cytologic features were studied in detail in all the 96 cases and were correlated with the histopathological diagnosis in the 55 cases, where correlation was possible.

Out of 96 cases with satisfactory aspiration: 55 cases were followed by biopsy.

Out of the 55 cases subjected for HPE: 33 were benign (60%) and 22 were malignant (40%)

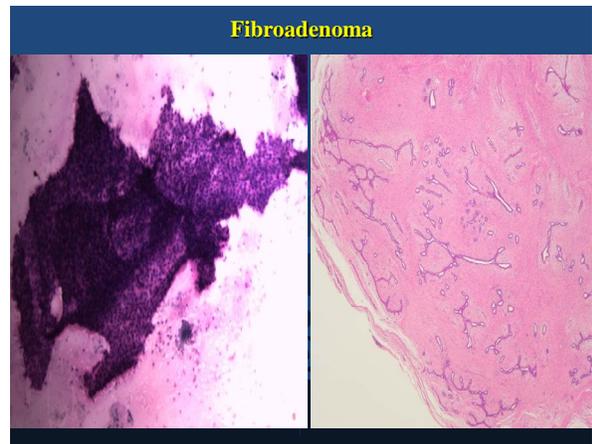


Age distribution of 55 cases with histopathological correlation

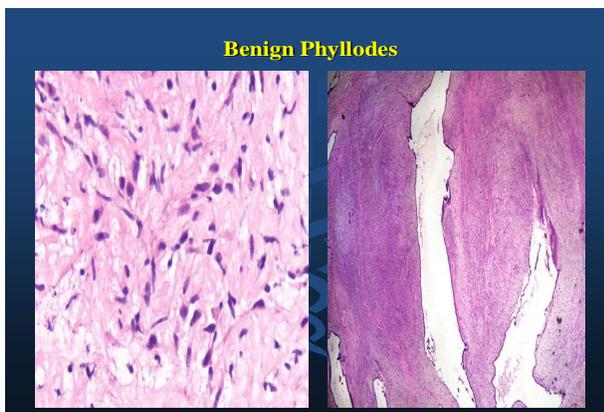
Age group	Benign		Malignant		Total	
	No of cases	%	No of cases	%	No of cases	%
13 - 20	4	7.2%	-	-	4	7.2%
21 - 30	9	16.3%	1	1.8%	10	18.1%
31 - 40	18	32.7%	4	7.2%	22	40%
41 - 50	2	3.6%	6	10.9%	8	14.5%
51 - 60	-	-	5	9.09%	5	9.09%
61 - 70	-	-	5	9.09%	5	9.09%
71 - 80	-	-	-	-	-	-
81 - 90	-	-	1	1.8%	1	1.8%
Total	33	60%	22	40%	55	100%

Cytological diagnosis of breast lesions

Cytological Diagnosis	No of cases	Percentage
Malignant	21	38.1%
Benign	34	61.8%
Total	55	100%

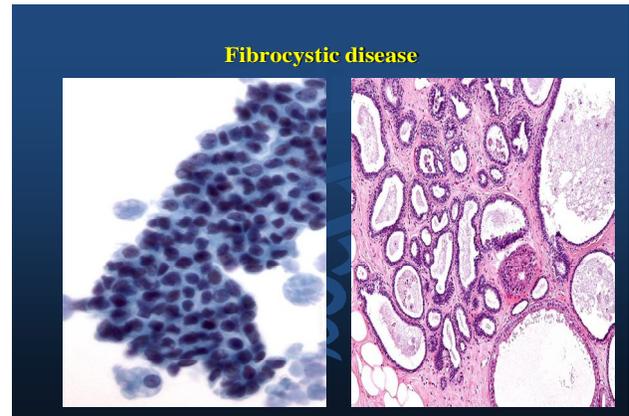


Cytologically, all the cases showed monolayered sheets and clusters of ductal epithelial cells, benign bare bipolar nuclei and fragments of fibromyxoid stroma. Histopathology confirmed the diagnosis in all 17 cases, thus 100% correlation was obtained in cases of fibroadenoma.

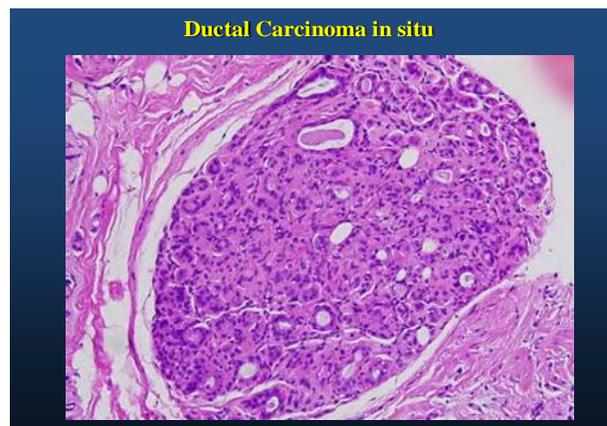
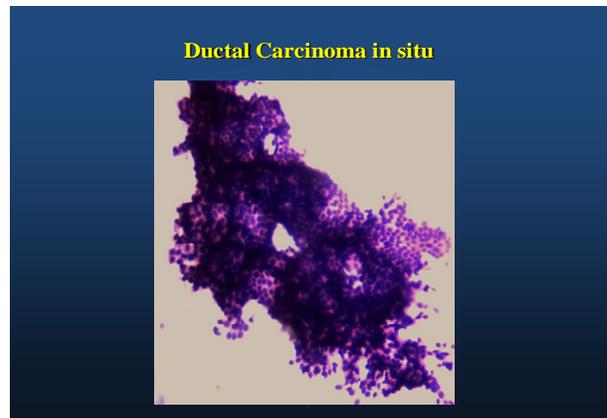


2 cases of phyllodes were reported as benign breast disease on FNAC. One patient was 21 years old and another was 33 years old. Cytologically, smears from the cases showed high cellularity with stromal fragments and groups of ductal epithelial cells with plenty of benign bare nuclei and spindle cells. One reported as benign phyllodes tumor on histopathology showed hypercellular stromal tissue, benign glandular elements many of which are compressed, areas of cystic change and fibroadenomatoid morphology, while other case reported as low grade phyllodes tumor showed

hypercellularity and benign looking glandular elements lined by cuboidal to low columnar epithelium with round to oval nuclei, resting on myoepithelial layer. The stroma was abundant showing cleft like spaces consisting of oval to spindle shaped cells.

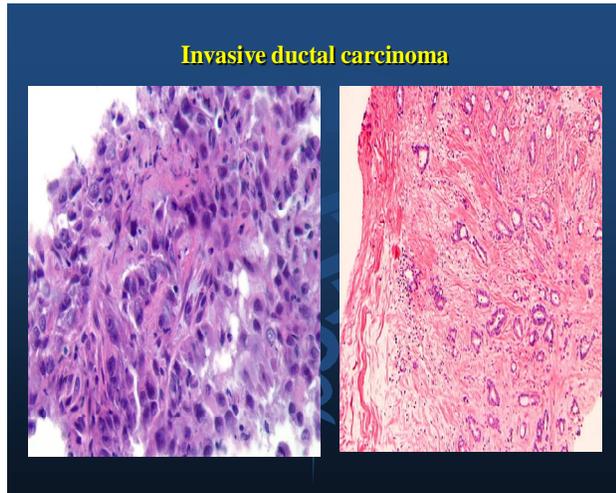


6 cases were cytologically diagnosed as fibrocystic disease. Cytologically, these cases showed moderate cellularity having benign ductal epithelial cells admixed with myoepithelial cells. The ductal cells were having moderate amount of cytoplasm with round to oval nucleus. Also seen were apocrine cells and benign bare nuclei. The background showed stromal component, fibroadipose tissue and haemorrhage. All cases were confirmed as fibrocystic disease on histopathological examination.



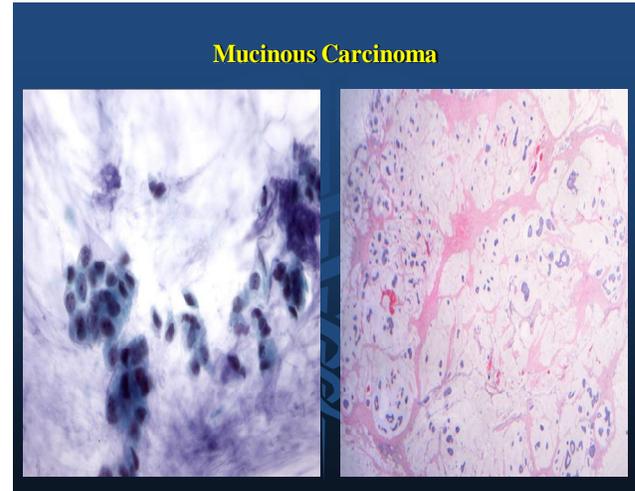
5 cases were diagnosed as ductal carcinoma.

Cytologically, the smears were cellular and showed sheets, clusters and dispersed tumor cells showing moderate amount of nuclear pleomorphism and some of the cells showing prominent nucleoli. Histological examination confirmed the diagnosis in all the 5 cases giving 100% correlation.



cytoplasmic ratio, scant cytoplasm and pleomorphic nuclei with prominent nucleoli. 1 case showed cells arranged in micropapillary pattern.

All cases were confirmed as invasive ductal carcinoma on histopathology and hence 100% correlation was obtained.



11 cases were diagnosed as IDC on FNAC. All the patients were in the age group of 30-70 years. Out of 11 cases, 1 case had lump in both breasts and 10 cases had unilateral lump. 6 cases involved right breast while 4 cases involved the left breast.

Cytologically, the smears were highly cellular with loose cohesive clusters and irregular sheets of malignant epithelial

cells in discohesive sheets and scattered singly. The individual cells are atypical having moderate amount of eosinophilic cytoplasm and hyperchromatic nucleus. The background showed abundant mucin.

This case diagnosed as Mucinous carcinoma on FNAC and was confirmed the same on histopathological examination.

FNAC diagnosis	Histopathological Diagnosis											
	fcd	fa	fah	pt	bd a	ad h	dci s	idc	Me d ca	IL C	Mu c ca	tot al
FCD	6											
FA		17										
FAH			4									
B.PT				2								
BDA					1							
ADH						3			1 nc			
DCIS							5					
IDC								11				
Med Ca									1			
ILC										3		
Muc Ca											1	
Total	6	17	4	2	1	3	5	11	2	3	1	55

4. Results of the present study

- Total number of cases = 55
- True positive = 21
- True negative = 33
- False negative = 01
- False positive = 00
- Sensitivity = 95.45%
- Specificity = 100 %
- Positive predictive value = 100%
- Negative predictive value = 97.06%
- Diagnostic accuracy = 98.18%

5. Discussion

- Among 100 cases, 4% of the aspirates were unsatisfactory and 96% were satisfactory.
- According to Shrestha A et al, unsatisfactory sample can be due to insufficient experience of the pathologist, radiologist or clinician who perform FNA or due to the nature of the lesion itself. FNA sampling technique is equally important as sample interpretation in reaching

correct diagnosis. Provision of adequate sample and experienced pathologist can prove FNAC as highly reliable diagnostic tool.

- Among 100 cases, 55 were biopsied subsequently and subjected to histopathological study. 33 cases were benign and 22 cases were malignant on histopathology.
- Age of the patients ranged from 17 to 82 years with a mean age of 38.6 years.
- For benign lesions, the maximum number of patients were in the age group of 31-40 years(32.7%) and for malignant lesions, the maximum number of cases were in the age group of 41-50 years(10.9%). Similar study was done by Mahajan NA et al and noted that maximum number of patients were in 3rd decade.
- Out of 34 cases reported as benign, 33 were confirmed on histopathology whereas one case which was reported as atypical ductal hyperplasia turned out to be malignant on HPR thus giving 1 false negative result.
- 21 cases were reported as malignant and all were confirmed as the same by histopathology.

Table: Showing Comparison of Statistical Data with Other Studies

Name of the study	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Diagnostic Accuracy (%)
Muddegowda PH et al (2011)	94.5	98	95.8	97.4	97
Bukhari MH et al (2011)	98	100	97	100	98
Alema ON et al (2012)	83.3	100	100	98.6	98.7
Mahajan NA et al (2013)	96.66	98.66	96.77	98.66	98.11
Dominguez F et al (1997)	93.49	95.73	93.49	95.73	94.84
Ariga R et al (2002)	98	98	99	91	98
Present study	95.45	100	100	97.06	98.18

6. Conclusion

Fine-needle aspiration (FNA) cytology is a technique utilized in the diagnosis of palpable breast masses owing to its distinct advantages of being sensitive and specific, expedient, economical and safe. Fundamentals to the success are gathering of accurate and complete clinical history, technical competence in obtaining the aspirate, preparation of initial smears and their evaluation. Accuracy of FNAC enables to proceed with surgery or not. It bridges the gap between clinical evaluation and final surgical pathological diagnosis in majority of cases. It enables the clinician to obtain a diagnosis in high percentage of cases with minimal expenditure of time and money and often to avoid

unnecessary surgery.

The present study suggests that FNAC gives good positive correlation with histopathology with high sensitivity and specificity. Hence FNAC is a well-established first line diagnostic test and effective screening tool for evaluation of breast lesions. It can provide valuable information and in most cases a correct diagnosis.

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