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Original article:

Study of patterns of breast lesions on imprint cytology

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Abstract

Introduction: The technique of imprint cytology is accurate , simple , rapid , cost effective and do not require any special instrument , in contrast to frozen section which is more time consuming , required specialized equipment , need well trained histopathologist , expensive and may not be always available.

Methodology: All surgically removed breast specimens which were sent to Histopathology department of KIMS University , Karad, from June 2016 to May 2018 were included in this study. Imprint cytology was done on freshly removed tissue. Excessive haemorrhagic fluid was washed away and gross examination of the lesions were recorded. Suspected areas were sliced into several pieces.

Results: In present study , findings on imprint cytology were categorized in cytological criteria of C1 – C5. Total 22 cases were categorized under C2 , fibroadenomas were the commonest finding. Total 6 cases were categorized under C3 and only one case was categorized as C4. 31 cases were categorized under C5 and they were of positive for malignancy , mucinous carcinoma and medullary carcinoma. There was no case noted under C1 category in this study.

Conclusion: In our study , we concluded that imprint cytology is simple, reliable , quick and inexpensive method.

Keywords: Imprint cytology, breast carcinoma

Introduction:

Breast lesion in female have gained a global attention as it leads to morbidity and mortality cause by breast cancer. [1]In developing country like India , incidence of breast cancer is increasing now a days even in their younger age.[2] It is important to aware the patients about self breast examination which will help surgeon in identifying lesion earlier. [3,4]The technique of imprint cytology is accurate , simple , rapid , cost effective and do not require any special instrument , in contrast to frozen section which is more time consuming , required specialized equipment , need well trained histopathologist , expensive and may not be always available. [5,6,7] The procedure for imprint cytology can be done even in underdeveloped infrastructure and with minimally trained technician. Analysis of an individual cell is performed by imprint cytology. It provides an immediate result with minimal artifact , it is cheaper and so it is commonly used. A precise diagnosis is received through this technique.[8]

Methodology:

This prospective , observational study was done among 60 patients in tertiary care hospital over a period of 2 years with 60 as sample size.

Inclusion criteria - All surgically removed breast specimens which were sent to Histopathology department of KIMS University , Karad, from June 2016 to May 2018 were included in this study.

A relevant clinical data regarding age, history and examination was recorded in the proforma.

Exclusion criteria – Formalin fixed specimens were excluded in this study.

Imprint procedure - Imprint cytology was done on freshly removed tissue. Excessive haemorrhagic fluid was washed away and gross examination of the lesions were recorded. Suspected areas were sliced into several pieces.

For small mass , it was bisected , the freshly cut surface of tissue is then imprinted onto a clean glass slide. For larger mass, the portion of tissue used for imprinting was trimmed to approximately 1 cm in diameter and the same above procedure is repeated.

Imprints were obtained by gently pressing the clean glass slides against the cut surface of the lesion and allowed it to dry. Pressure applied for imprinting varied with the consistency of specimen. Care was taken to avoid any gliding movements. Average four slides from each case were prepared.

The slides were immediately fixed in 95% ethyl alcohol in order to avoid drying artifact. After that slides were stained with rapid H & E.

Results:

In present study total 60 cases of surgically removed breast specimens were evaluated by Imprint Cytology and Histopathology. The results of Cytodiagnosis were compared with Histopathological diagnosis.

Age of patient varied within 16 to 75 years. 24(40.0%) patients were in the age group of 21–40 years followed by 23 (38.3%) patients in 41-60 years, 09 (15%) patients in 61-80 years and 04 (6.7%) patients in 16-20 years of age with mean age of 42.3 years and standard deviation of 15.8 years.

Out of 60 patients 59 (98.3%) patients were female and only 1 (1.7%) patient was male.

Table 1: Distribution of cases of imprint cytology under cytological criteria -

Criteria	Finding	Frequency	Percent
C1	Inadequate	0	0
C2	Benign	22	36.7
C3	Atypia probably benign	06	10.0
C4	Suspicious for malignancy	01	1.7
C5	Malignant	31	51.7
	Total	**60**	**100**

Majority of cases in this study were (51.7%) categorized under C5 followed by C2 (36.7%) and C3 (10.0%) whereas only one (1.7%) was categorized under C4 lesion. There was no lesion categorized under C1.

Table 2: Distribution of findings of breast lesions on imprint cytology –

Findings	Frequency	Percent
Benign breast lesion	01	1.7
Inflammatory lesion	01	1.7
Benign Phyllodes tumor	01	1.7
Fibrocystic change	02	3.3
Fibroadenoma	17	28.3
Fibroadenoma with atypia	06	10.0
Suspicious for malignancy	01	1.7
Medullary Carcinoma	01	1.7
Mucinous Carcinoma	01	1.7
Positive for malignancy	29	48.3
Total	**60**	**100.0**

In this study , lesions diagnosed on imprint cytology were 1 case (1.7%) each of benign breast lesion, benign phyllodes tumor , inflammatory lesion, and suspicious for malignancy , mucinous carcinoma and medullary carcinoma. Total 17(28.3%) cases were diagnosed as fibroadenoma, 31 (51.6%) cases were diagnosed as Positive for malignancy , 6 (10.0%) cases were diagnosed as fibroadenoma with atypia and 2 (3.3%) cases as fibrocystic change.

Table 3: Distribution of Imprint lesions under cytological criteria -

Imprint cytology	cytological criteria (C1 - C5)					Total
	C1	C2	C3	C4	C5	
Benign Phyllodes tumor		1				1
Benign breast lesion		1				1
Inflammatory lesion		1				1
Fibrocystic change		2				2
Fibroadenoma		17				17
Fibroadenoma with atypia			6			6
Positive for Malignancy					29	29
Mucinous Carcinoma					1	1
Medullary Carcinoma					1	1

Suspicious for malignancy				1		1
Total	**0**	**22**	**6**	**1**	**31**	**60**

Chi-Square Tests	Value	df	P value
Pearson Chi-Square	180.00	27	<0.001

In present study , findings on imprint cytology were categorized in cytological criteria of C1 – C5.

Total 22 cases were categorized under C2 , fibroadenomas were the commonest finding.

Total 6 cases were categorized under C3 and only one case was categorized as C4.

31 cases were categorized under C5 and they were of positive for malignancy , mucinous carcinoma and medullary carcinoma.

There was no case noted under C1 category in this study.

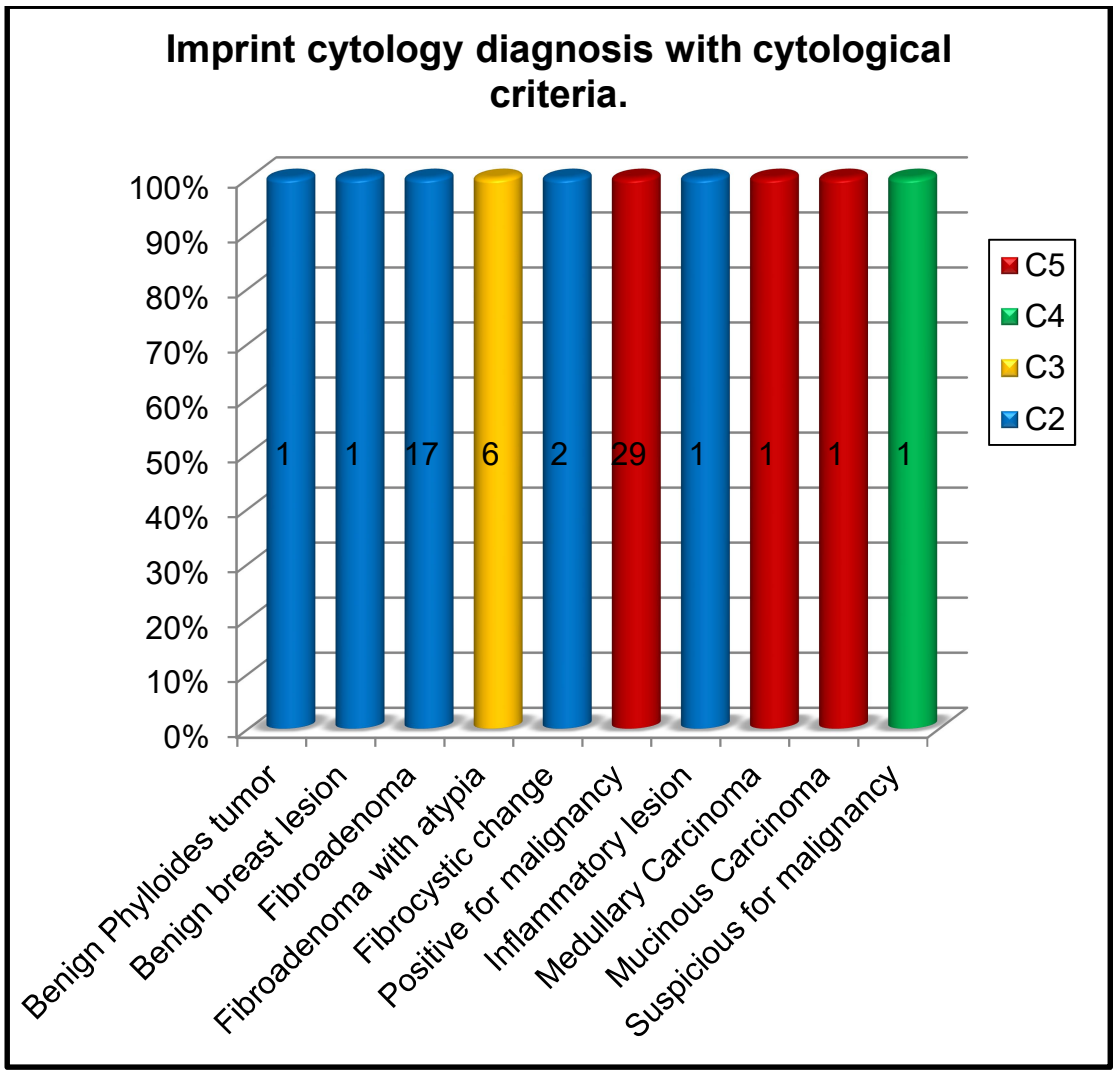

Fig. 1 – Imprint cytology diagnosis and cytological criteria.

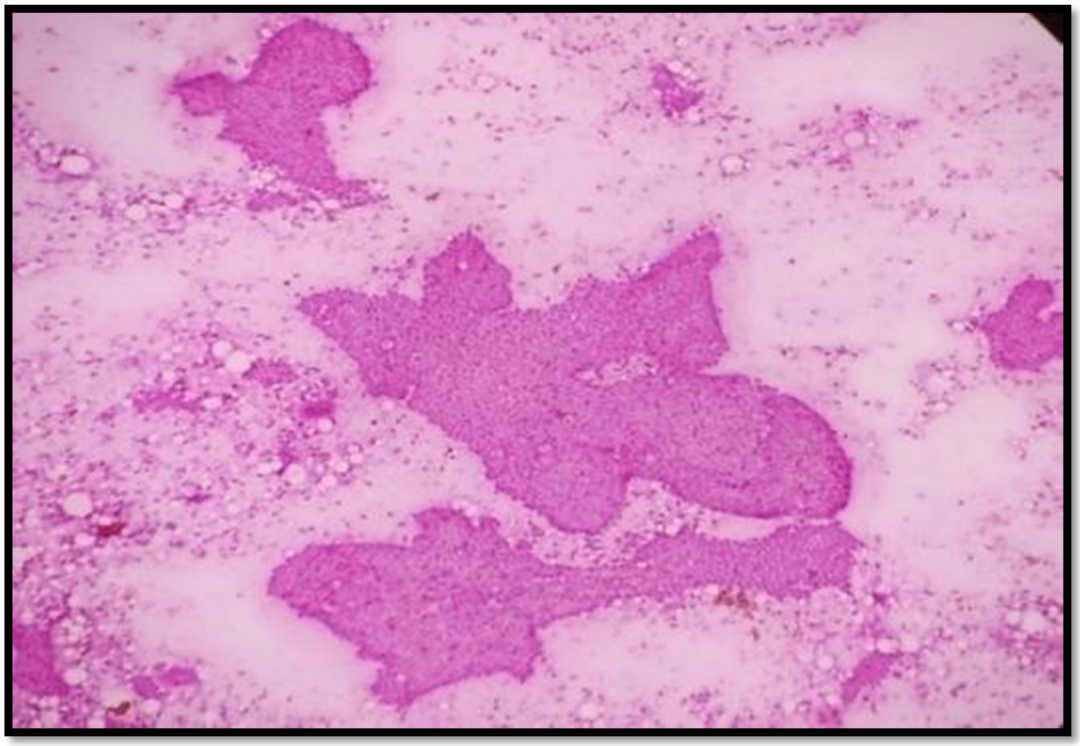

Fig.2 . – Imprint smears showing ductal epithelial cells arranged in monolayered sheets and seen forming honey coombing pattern. Bare bipolar nuclei noted. Epithelial proliferating lesion without atypia s/o Fibroadenoma.(H & E stain , 100x & 400x)

Discussion:

Imprint cytology is widely accepted in evaluating lumpectomy margins in patient operated for breast conservative therapy and it will help surgeon to re excise during the initial surgery only. In current study, we have not taken lumpectomy margins into consideration. These intraoperative techniques have also gained popularity in assessing the sentinel lymphnode status.[9]

It is advised to use imprint method and scrape cytology method together to achieve better cellular features. It was observed that out of total 60 cases , only one case was non neoplastic and rest of 59 cases were neoplastic. Out of total 59 noeplastic lesions, 22 lesions were benign , 6 lesions were benign with atypia, 1 case of suspicious for malignancy and remaining 31 lesions were of malignant.Out of 22 benign lesions , fibroadenoma was the commonest finding followed by fibrocystic change , benign phyllodes tumor and benign breast lesion. Similar findings were noted by Hiregoudar AD et al[10] and shashidhar MR et al[11] as shown in the table. Out of total 31 malignant lesions, cases of medullary carcinoma , positive for malignancy and mucinous carcinoma were noted. Hiregoudar AD et al[10]and shashidhar MR et al[11] also observed the same.

Table 4 : Comparision of lesions diagnosed on imprint with different studies.

Sr. no.	Lesions	Hiregoudar AD et al[10]	Shashidhar MR et al[11]	Present study
	Benign lesions			
1.	Fibroadenoma	12(30%)	26(26%)	17(28.3%)
2.	Fibrocystic disease	4(10%)	5(5%)	2(3.3%)
3.	Benign phyllodes tumor	-	4(4%)	1(1.7%)
4.	Inflammatory lesion	-	1(1)	1(1.7%)
5.	Benign breast lesion	1(2.5%)	2(2%)	1(1.7%)
6.	Fibroadenoma with atypia	-	-	6(10.0%)
7.	Lobular hyperplasia	2(2.5%)	-	-
	Malignant lesions			
8	Invasive breast carcinoma (Positive for malignancy)	20(50%)	38(38%)	29(48.3%)
9.	Mucinous carcinoma	-	5(5%)	1(1.7%)
10.	Medullary carcinoma	-	1(1%)	1(1.7%)
11.	suspicious for malignancy	-	-	1(1.7%)
12.	Papillary carcinoma	-	1(1%)	-

In this table , study done by Shashidhar MR et al and Hiregoudar AD et al have used the term Invasive breast carcinoma but positive for malignancy term has been used here.

Remaining lesions found by Shahidhar MR et al were 1% cases of invasive lobular carcinoma , Papillary carcinoma , tubular carcinoma malignant phyllodes tumor , 6% cases of fat necrosis , 4% case of no residual tumor and 2% cases of foreign body granuloma.

Categorization of lesions diagnosed by imprint method under cytological criteria–

Majority of lesions in our study were (51.7%) categorized under C5 followed by C2(36.7%) and C3 (10.0%) whereas only one (1.7%) was categorized under C4 lesion.

Categorization of lesions diagnosed by imprint method under cytological criteria–

Sr. no	Studies done	Total case	Inadequate [C1]	Benign [C2])	Atypia probably benign [C3]	Suspicious for malignancy [C4]	Malignant [C5]
1.	Karre S et al[12]	50	-	31(6%)	4(8%)	-	15(30%)
2.	Khudier HH et al[13]	110	9(8.2%)	71(64.5%)	-	4(3.6%)	26(23.6%)
3.	Ramraje SN et al[14]	90	9(10%)	41(45.5%)	1(1.1%)	-	39(43.3%)
4.	Present study	60	-	22(36.7%)	6(10.0%)	1(1.7%)	31(51.7%)

Majority of lesions in our study were (51.7%) categorized under C5 followed by C2(36.7%) and C3 (10.0%) whereas only one (1.7%) was categorized under C4 lesion.

Conclusion:

In our study , we concluded that imprint cytology is simple, reliable , quick and inexpensive method.

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