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The Accuracy of Touch Imprint Cytology of Core Biopsies from Breast Lesions

Authors
Dr Mamta[1], Dr Rahul Kumar[2], Dr Radhika Raman[3*]
[1]3rd yr PG, Gen Surgery, NMCH, Patna
[2]Senior Resident, Gen Surgery, NMCH, Patna
[3]Associate Professor Gen Surgery, MD Anaesthesia, MS Gen Surgery
*Corresponding Author
Dr Radhika Raman

Abstract
Introduction: *Touch imprint cytology is a very simple method of transferring the cells from the tissue core to the slides and evaluating the same under light microscope. Here we use it for the diagnosis of breast lump either it is benign or malignant.*
Aims and Objective: *To evaluate the efficacy of touch imprint cytology by comparing it with histopathology report.*
Material and Method: *Core was cut from the exercised lump of 50 patients and touch imprints were received on slides. They were studied under light microscope after fixing it with absolute alcohol. Results were compared with the histopathology report.*
Result: *2 Cases showed false negative result and 20 were true positive. The sensitivity was found to be 93 %*
Discussion and Summary: *Present study showed that touch imprint cytology yield adequate and satisfactory diagnostic material. It can be used at the site of biopsy and timely diagnosis can be done.*

Introduction

Breast lesion including carcinoma breast are potentially curable if it is diagnosed at time and proper treatment is given. For this purpose evaluation of breast lump is done by triple assessment. On table diagnosis of breast lump can be done by frozen section and touch imprint cytology. The facility for frozen section is not available at all the centers.

Touch imprint cytology has been used by many researchers to evaluate the breast lump as one of the method of tissue sampling. It is very simple method of transferring the cells from the tissue core to the slides and evaluating the stained preparation of the same under light microscope.

Aims and Objective

To study and compare the touch imprint cytology with histological report of breast lump and find its sensitivity, specificity, positive predictive value, negative predictive value, and accuracy.

Materials and Methods

The study was conducted in Nalanda Medical College and Hospital, Patna. 50 cases of breast lump who need surgical intervention were taken

for study. The patients having acute breast abscess were excluded from the study.

Preoperative FNAC was done in all the selected cases and as per the report of FNAC in each case patients underwent either an excision biopsy or quadrantectomy or modified radical mastectomy or simple mastectomy with or without axillary clearance.

The core was cut from the exercised lump. The imprints were taken from all the 6 surfaces of core by pressing 6 clean slides avoiding sliding movement.

The slides were immediately fixed in 95% ethyl alcohol for 5 to 6 minutes after air dried. Further those slides were stained with Hematoxyline and Eosin. Finally it was studied under microscope by pathologist. The cut lump was sent for histopathological examination.

Observations and Result

A total of 50 cases of breast lump were studied. Age of the patient ranged from 15 yrs to 75 yrs.

The various diagnosis offered on imprint cytology are shown in Table 1 and figure 1 and 2

Table 1 Diagnosis on Touch Imprint Cytology

DIAGNOSIS	NUMBER OF PATIENTS
Benign	32
Malignant	18
Total	50

Out of 50 cases 32 were benign and 18 cases were malignant.

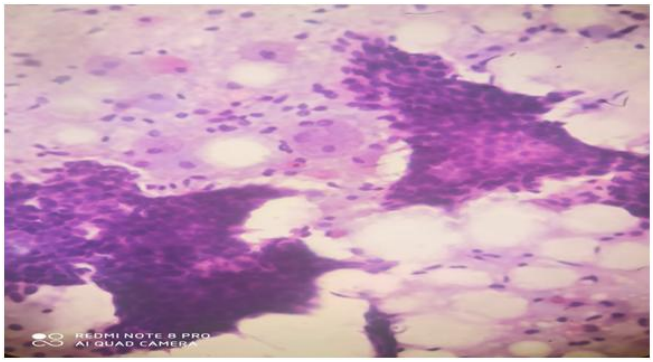


Fig-2 Microscopic Picture of Imprint Cytology of Benign Breast Lump

Imprint cytological features of benign lesion on microscope

Over all low cell yield except in fibroadenoma.

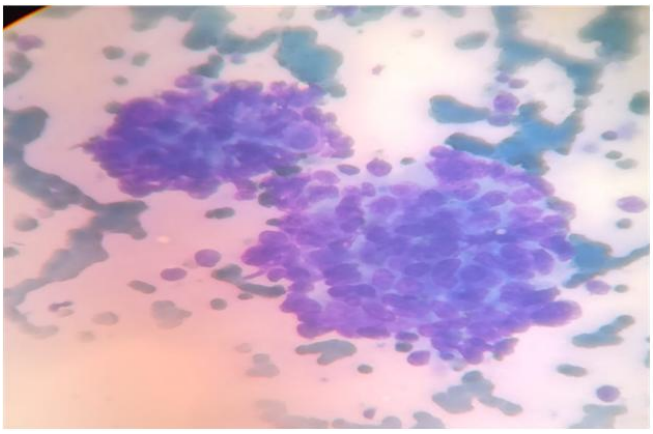
Imprint smear consisted of aggregates of cohesive, small, uniform cells

Small rounded nuclei

Bland chromatine

Variable number of single bare bipolar nuclei

Background of acute and chronic inflammatory cells



Microscopic Picture Of Malignant Lesion On Imprint Cytology

Imprint cytological finding of malignant lesion:

Variable appearance with high cell yields

Irregular clusters of large discohesive cells

High N: C ratio

Hyperchromatic

Pleomorphic nuclei

Irregular coarse chromatine

Prominent nucleoli

Background of necrotic cells

Result of Histopathology

Histopathological reports of removed lumps has been shown in Table no. 2

Table 2 : Histopatholgy of Breast Tumor

DIAGNOSIS	CASES
Fibroadenoma	25
Fibricystic disease	4
Phyllodes tumor	2
Intraductal carcinoma	19
Total	**50**

Out of 50 cases 30 patients were benign and 20 were malignant.

Table 3: Comparison Of Intraoperative Imprint Cytology With Histopathology

Nature Of Tumor	Imprint Cytology	Histopathology
Benign	32	30
Malignant	18	20

Out of 50 cases in Touch Imprint Cytology 32 were benign and 18 were malignant but in histopatholgy 30 cases were benign and 20 were malignant.

So it is seen that Intraoperative imprint cytology shows two false negative cases.

Predictive value and accuracy of intraoperative touch imprint cytology has been shown in Table no 4.

Table 4: Predictive Value of Touch Imprint Cytology

TEST RESULT	MALIGNANT	BENIGN
Positive	20 True Positive(TP)	0 False Positive (FP)
Negative	2 False Negative(FN)	30 True Negative (TN)

From the above data sensitivity, specifically, false negative rate, positive predictive value, negative predictive value, and accuracy is calculated as follows and shown in Table no. 5.

Here all cases found malignant on HPE are taken which is 20 are true positive and Benign on HPE are true negative which in this case is 30.

Cases which are malignant in HPE but benign on cytology imprint are false negative which is 2 and benign on HPE but malignant on imprint cytology are False positive which is 0 in my study.

Table 5: Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value, Accuracy, False Negative Rate

Sensitivity	Specificity	PPV	NPV	Accuracy	False Negative
90.9%	100%	100 %	93.75 %	96.15%	9.05%

From the above table it can be seen that sensitivity, specificity, positive predictive value, negative predictive value, accuracy, false negative rate are 90.9%, 100%, 100%, 93.75%, 96.15%, 9.09% respectively.

Discussion

The technology of imprint cytology was first introduced by Dudgeon and Patric in 1927. Later on various works like Tribe (1965); K C Suenet (1971); Popp et al (1991); Cox et al (1998); A R Carmical et al(2003); Abhijit D Hirogandar et al (2006); Amit Adhya (2019) have done work over it.

As the fashion of breast conservation surgery for the treatment of breast cancer are becoming popular the need for intraoperative consultation of the nature of the breast tumor is getting more and more important. So the utility of imprint cytology is paving way as an adjunct to frozen section at poor resource centers where technology of frozen section is not available. Touch imprint cytology initially described in 20 th century have recently gained more popularity for the evaluation of margin in breast conserving surgery.

In our series we reported the sensitivity of 90.9%, specificity and positive predictive value of 100%, negative predictive value of 93.33% which is not much different from the study done by different workers like Lee reported accuracy 92.9%, Poppet et al sensitivity 97.3%, specificity 100% , Cox et al sensitivity 100 %, specificity97%, positive predictive value 100% and negative predictive value 88%. Abhijeet D Hiregoudar et al reported accuracy rate for benign was 100 % and for malignant was 97.5 %, and false negative rate was 2.5 %.

Conclusion

In conclusion imprint cytology is simple, rapid, inexpensive and accurate method for intraoperative diagnosis of breast lesion and can be used as adjunct to frozen section.

The usefulness of imprint cytology is not limited to simple differentiation between benign and malignant lesion but it has been also found quite reliable and useful in determination of surgical resection margin .Accordingly surgeons can modify their surgical plan based on intraoperative consultation from pathologist, as it provides

accurate result in minutes while the patient is under anesthesia.

Imprint smear do not have the disadvantage of tissue destruction and freeze thraw artifacts that routinely occurs with frozen section

Imprint of core biopsy of breast are relatively simple and inexpensive to prepare. They can be readily incorporated into the workflow of existing same day breast assessment clinics and hence same day patients counselling and management planning.

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