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ROLE OF IMPRINT CYTOLOGY IN DIAGNOSIS OF BREAST LUMPS- A REVIEW

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ABSTRACT

In yet another study conducted by Khanna et all Fine needle aspiration cytology, Imprint cytology and Tru-cut biopsy were done in a total of 86 patients with breast lump and the results were finally interpretated and the data compared FNAC,IC and Tru cut biopsy and it was found that the sensitivity and specificity of FNAC was 96.8% and 100% whilst imprint cytology had a sensitivity and specificity 98.4%, 100%, Tru cut 100% sensitivity and specificity. Of the 86 patients taken up for the study 15 people were rejected due to inadequate sample

KEYWORD

histopathological, imprint cytology, squash smears

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INTRODUCTION:

Breast diseases are commonly encountered clinical entities in surgery outpatient department. Fine needle aspiration cytology is a well established diagnostic modality in detecting breast lumps with an increased sensitivity, core needle biopsy has even more accuracy than fine needle aspiration cytology in diagnosing breast lumps .Imprint cytology is touch preparation of the intra-operative specimen in the form of cells in glass slide followed by examination (1)

Intraoperative evaluation of histopathological type during surgery might help the surgeon decide the appropriate surgery on table. Intraoperative imprint cytology remains still a topic of controversy(2)

The most common malignancy amongst woman is breast carcinoma. Despite adequate recognition of histological variant by needle biopsies and also evaluation of lumpectomy margins and operative nodal status by frozen sections it has an added advantage of delivering the results within minutes that might influence therapeutic decisions.(3).The incidence of breast carcinoma in Indian population is 25.8 per one lakh population and it's been estimated to be around 112 cases per 100000 patients being screened for breast cancer(4,5)

Imprint cytology has a better visualization of morphological features of cells (8)It has a great impetus to histological diagnosis due to its rapidity ,simplicity and cost effectiveness (9).Apart from diagnosing breast lesions it is also being employed in the diagnosis of a wide variety of other lesions including thyroid, sentinel nodes, endoscopic biopsy and prostate etc(10,11)The sensitivity and specificity of imprint cytology in breast lesions was found to be 100% and 96.43%(3)

METHODS:

Relevant publications collected from Pub Med , Google scholar, EMBASE, MEDLINE ,Cochrane database of systematic reviews were included in the review. The key search words used were imprint cytology, Histopathology and breast lesions/lumps .No restrictions were made based on date of publication. Duplicate copies of the publications were eliminated. Data compiled based on accuracy of imprint cytology in the diagnosis of breast lumps.

DISCUSSION :

IMPRINT CYTOLOGY

The intraoperative accuracy of tumor is essential for the patient's treatment. Though intraoperative accuracy of a tumor can be achieved with the help of frozen section and cytologic examination. Various methods have been established using FNAC, imprint cytology and squash smears to establish the tumor and surgical margins.

Origin of cytology dates back for more than a century in diagnostic pathology. In imprint cytology tissue is touched onto the slide and it leaves behind its imprint in the form of cells on a glass slide .Diagnostic cytology is the science of interpretation of cells on epithelial surface or from the ones derived from various sources by artificial means(25). Imprint cytology has been a useful alternative to frozen section in underdeveloped countries(26).Imprint cytology is a form of touch preparation wherein tissues are touched onto a slide only to create imprint on the glass slides (cell forms)(27).Indeed a second surgery could be avoided if a well documented imprint report is obtained (28).Similar imprint studies have been conducted even in the setting of endoscopic cytology by Hughes et al to aid in the diagnosis of carcinoma stomach(29).Certain studies have disparities in efficacy of imprint cytology(30). Similar studies by Tew et al to

evaluate the evidence of metastasis to sentinel node have also been conducted and were proven to have increased efficacy(31).

In a study by Kashiwagi et al imprint of core needle biopsies have been done and it was proven to be a effective rapid reliable method for diagnosing breast lesions(32).Imprints have also been used in assessing the surgical margins in operative cases of breast lesions(33).

In a study conducted by Narendranath Swain, Bharat Kumar Behera, Sukanti Majhi, Manindra Nayak et al ,in about 64 patients 60 patients were female and 4 patients are male with female to male ratio being 15:1 with average age range between 11-70 years with mean age in females being 40.5 years and male being 40.5 years .Amongst 64 people the chief complaints were breast lump in 100 percent of patients related to mastlgia in 24 ,menstrual cycle in 12,nipple discharge in 4 and skin ulceration in 8, anatomically it was in upper outer quadrant in 30 ,12 in upper inner quadrant,11 in lower outer quadrant,8 in lower inner quadrant and 3 in central region. On cytological examination the cause was inflammatory in 3 people, benign in 32 numbers and malignant in 29 people. FNAC had a sensitivity of 93.3% and a accuracy of 95.3%.tru cut needle biopsy had a sensitivity of 100% and specificity of 100% and a accuracy of 98.4%.Imprint cytology had a sensitivity of 96.4% and a overall accuracy of 95.3% (43).

In yet another study conducted by Khanna et all Fine needle aspiration cytology, Imprint cytology and Tru-cut biopsy were done in a total of 86 patients with breast lump and the results were finally interpretated and the data compared FNAC,IC and Tru cut biopsy and it was found that the sensitivity and specificity of FNAC was 96.8% and 100% whilst imprint cytology had a sensitivity and specificity 98.4%, 100%, Tru cut 100% sensitivity and specificity. Of the 86 patients taken up for the study 15 people were rejected due to inadequate sample(44).

In a study done by Dr Ravindran Chirukandath1, Dr Venita Juliet Noronha, Dr RemaniK, Dr Sarath Krishnan imprint cytology was done on a total of 110 freshly excised surgical specimens and the results were found to be astounding with an impeccable accuracy rate. It was found that the imprint cytology ad a sensitivity of 95.6% and a specificity of 100%.although the draw backs were the lymphoma detection was not accurate .Hence the imprint cytology has been established to be a quick alternative for intraoperative specimen histopathological examination(28).

In yet another study by Asha Mahadevappa, Thattamparambil Gopalakrishnan Nisha, GubbannaV Manjunath. A total number of 62 patients were included in the study one was excluded as the sample was inadequate hence only 61 patients were included in the study and compared with histopathological examination .In imprint cytology and frozen section one was false positive due to error in interpretation.Imprint correlation with histopathological examination and showed a total of 93.1 percent correleation.Sensitivity and specificity of imprint cytology was 100% and 96.4%.accuracy was 98.6% .frozen section had a sensitivity and specificity of 100 and 96.55%(3).

In a study conducted by Ramraje et al with a main objective to prove the accuracy of imprint cytology in comparison with histopathological examination the study was conducted in a total of 90 patients over a period of 2 years and it was found that imprint cytology diagnosed 81 cases of 90 accurately which is approximately 90%(45).

In a study conducted by Ronald enrique Delgado bocanegra et althe mean age was found to be 51 years and the most common histological variant was ductal carcinoma .Imprint cytology had a sensitivity of 61.8% and an accuracy of 86.3%(46).

In a study conducted by Motomura k et al imprint cytology results were compared with frozen section and imprint cytology had a sensitivity and specificity of 96% and 90% while frozen section had a sensitivity and specificity of 90% and 98.5 %and thus again proving the diagnostic accuracy of imprint cytology amongst other diagnostic modalities(47).
In a study conducted by Petroupoluet al ,a total of 60 patients were studied and sensitivity and specificity of sentinel lymph node was 90%and 100% and 80% and 100% for frozen section(48).

Intraoperative diagnosis of breast cancer deposits in axillary nodes is essential to prevent a second surgery. Imprint cytology is an effective technique aiding in the diagnosis with a high specificity and sensitivity. In a study conducted by K Tew et al which was a metanalysis. Thirty one studies were included and they all showed a pooled sensitivity of imprint cytology to be 63 percent and specificity of 99 percent .and frozen section had more sensitivity and specificity than imprint cytology(31).

In another study conducted by Karla Esbona et al intraoperative imprint cytology in assessment of surgical margins the final results were interpretated in terms of re-excision and was found to be 35% for histopathology,11% for imprint cytology and 10% for imprint cytology and the sensitivity was 83% for imprint cytology and 72% for frozen section(50).

In a study done by Chandrakar et all the results showed out of 110 cases , 85 were diagnosed to be malignant and 25 were benign whilst 11 cases were reported to be false negative. Of these 85 malignant cases 78 were correctly diagnosed ,7 were negative. Accuracy of imprint was 83.63%(27).

CONCLUSION:

Both FNAC and imprint cytology have got their own merits and demerits. In concordance with the evidences in literature our study has shown that imprint cytology has high specificity and sensitivity in diagnosing breast lumps. However histopathology has got a better sensitivity, specificity in diagnosing breast lump. Larger study population and multi centric study may be required in establishing further efficacy of imprint cytology.

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