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INTRAOPERATIVE IMPRINT CYTOLOGY AND SURGICAL DECISION

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Abstract

A prospective study was conducted on 60 specimens; 33 breast lumps and 27 lymph nodes, to assess the value of intraoperative imprint cytology as an aid in surgical decision especially in the absence of the facility of frozen section examination. Imprint cytological examinations were done intraoperatively by a single pathologist. The results were ready after a period of 15-25 minutes. In all 60 specimens, 50 (83%) were correctly diagnosed, 8 were diagnosed as suspicious of malignancy and 2 were misdiagnosed.
The sensitivity was 97%, the specificity was 94.4% and the accuracy rate was 96.1%. We concluded that imprint cytology is a very simple technique and it remains a useful and cost effective tool, can aid in the surgical decision.

Introduction

Many patients undergoing surgery for tumour need intraoperative decision for selection of the optimal procedure. Such decision results from the followings:

- Knowing the nature of the manipulated mass, is it benign or malignant?
- Certifying that the margins of a resected malignant tumour are free of cancer cells.
- Getting a primary result about the cytological status of the resected lymph nodes that drain the site of malignancy.

These critical notes can be obtained by the use of the well known frozen section technique. Imprint cytology is a simpler and cheaper method, and similar results can be obtained in a comparable time [1].

This study aims to asses the accuracy of imprint cytology of breast and lymph node lesions and to determine its value in intraoperative decision.

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Patients and methods

This is a prospective study included 60 specimens; 33 breast lumps and 27 lymph nodes from different parts of the body.

Imprint cytological examinations were done intraoperatively by a single pathologist. The cytological examination results were classified as malignant, benign and suspicious. In 6 cases, mastectomy is decided intraoperatively depending on the malignant cytological results. Surgical options were explained to the patient and informed consent was taken preoperatively.

An imprint specimen is sent for rapid diagnosis during operation. The tissue submitted is grossly examined by the pathologist; he chooses the most suspicious area. The tissue is cut and the freshly cut surface is firmly scraped with a sharp scalped. A direct imprint is prepared by pressing a glass slide gently onto the freshly cut surface of the specimen. The imprint smears are immediately fixed in 95% ethyl-alcohol for 5-10 seconds and then stained (rapid haematoxylin and eosin). The entire process of imprint slide preparation took less than 5 minutes; about 10-15 minutes were needed for examination of the slides and informing the result to the operating team.

The tissue was then fixed in formalin and embedded in paraffin for conventional histopathological diagnosis.

Results

The study included examination of 33 breast lumps and 27 lymph nodes. Malignant diagnosis was made in 20 breast lumps (60.6%) and 22 lymph nodes (77.7%) Table I.

In all 60 specimens examined, 50 (83.3%) were correctly diagnosed by imprint cytology. Two cases were misdiagnosed, one false-positive and one false-negative. Malignancy was suspected in 8 cases, Table II.

The diagnostic accuracy of imprint cytology was 96.1%. The false negative diagnoses (2.4%) were lower than the false positive diagnoses (5.2%). The sensitivity was 97% and the specificity was 94.4%.

Out of 60 specimens examined, 8 were suspicious of malignancy; all were breast lesions, the majority of these suspicious lesions proved to be malignant by the histopathological examination.

Table I. Histopathological types of the lesions

Histopathological diagnosis	No	%
Breast		
Fibroadenoma	6	10
Ductectasia	2	3.3
Gynaecomastia	1	1.6
Fibroadenosis	4	6.6
Intraductal	6	10
carcinoma	1	21.6
Invasive ductal	3	1.6
carcinoma	1	
Inflammatory		
carcinoma		
Lymph node		
Follicular	5	8.5
hyperplasia	1	28.3
Secondary	7	5
carcinoma	3	1.6
Non-Hodgkin's	1	1.6
lymphoma	1	
Hodgkin's		
disease		
Tuberculosis		

Discussion

Imprint cytology is a cytological diagnostic method used for intraoperative diagnosis of tumours. Despite its simplicity, speed and excellent cellular detail, many centers are not utilizing this technique[2-4]. The diagnostic value of

Table II. Diagnostic results of imprint cytology

Diagnosis proved by histo-path examination	Results of imprint cytological examination								Total
	Correct diagnosis		False positive		False negative		Suspicious		
	No.	%	No.	%	No.	%	No.	%	
Benign	17	89.4	1	5.2	0	0	1	5.2	19
Malignant	33	80.4	0	0	1	2.4	7	17.07	41
Total	50	83.3	1	1.6	1	1.6	8	13.3	60

intraoperative imprint cytology is enhanced if it is used together with frozen section[5,6].

The specific reason for a surgeon to request an intraoperative imprint cytological diagnosis is usually related to his suspicion that the patient has a neoplastic lesion. He may want to determine the extent of tumour spread, or he may wish to evaluate the adequacy of the excision[6-9].

The pathologist's responsibility is great and his task is difficult because of the inherent problem in obtaining excellent frozen section preparations from fresh tissue. Accuracy of such a study may be improved and the task may be reduced by supplementing the frozen section with exfoliative cytology or imprint cytology[10,11].

In instances when a lesion is grossly malignant as in many cases of mammary carcinoma and many cases of metastatic carcinoma in lymph node, clearly positive imprint cytology would be sufficient for the purpose of intraoperative diagnosis.

In our study, decision for mastectomy was made intraoperatively depending on positive imprint cytology result. In another cases mastectomy was postponed because of the suspicious or negative imprint cytological results. The reported false negative rates indicate that a negative imprint dose not necessarily exclude malignancy.

False negative reports are generally due to either intraoperative errors occur in cytological well differentiated tumours inducing lobular types of breast carcinoma, or because of a dense fibrous stroma, the number of neoplastic cells transferred to the slide is insufficient to enable the observer to make a correct diagnosis.

Lymph node imprints have been used for many years as adjunct to or in place of routine section[2,4,12]. It helps in the diagnosis and classification of malignant lymphoma, helps in diagnosis of metastatic tumours, and it reduces sampling errors[13].

In this study a single false positive result occurred; the case was 11 years old male with enlarged inguinal lymph nodes, FNA result was suspicious and imprint cytological diagnosis was malignant lymphoma, while the histopathological diagnosis was follicular hyperplasia. This false positive results may be related to the very cellular imprints associated with lymphoid hyperplasia.

In conclusion

1. Imprint cytology remains a useful and cost – effective tool, it can support in the intraoperative decision.
2. Routine imprint cytology in patients with cancer reduces the discomfort and avoids the cost of reoperation.

3. The surgeon should be cautious in using imprint cytology as a sole means of diagnosis especially when the results are equivocal.

References

1.Rasai.J.Achermank's Surgical Pathology . (1985) 8th edition , PP; 1270 –1271.

2.D.H. Weright and P.G Isaacson. (1983) Biopsy pathology of the lymph-oreticular system, imprint cytology. London, Chapman and Hall PP.314-315.

3.Naib ZM.(1985). The breast. In: Exfoliative cytology. Boston-Toronto. Little Brown CO. PP.477-495.

4.Ultman J.E, Koprowska I. and Engle RLT.Jr. (1958). A cytological study of lymphnode imprints. Canser 11, 507-524.

5.Tung – Kuang Lee (1982) the value of imprints cytology in tumour diagnosis . A retrospective study of 522 cases in northern china. Acta cytologica. 26, PP: 169-171.

6.Mavec P . (1967) cytologic diagnosis from tumour tissue using the "quick method" during operation. Acta cytologica.11, PP: 229-230.

7.Pilar Pband Rubenstone AI. (1968)Acorrelation of breast imprints (stained by the method of papanicolaou) and tissue sections. Acta cytologica. 12,PP; 462-472.

8.Davis NC and little JH(1974) the role of frozen section in the diagnosis and management of malignant melanoma . British journal of surgery . 61, PP:255-257.

9.Shafir R, Hissj,tsur Hand Bubis LJ .(1983) imprint cytology in the intraoperative diagnosis of malignant melanoma. Acta cytologica, 27, PP:(255- 257).

10.Picren Jw and Burke EM (1963). Adjuvant cytology to frozen sections . Acata cytologica, 7,PP:164 – 167.

11.Suen KC, Yernakov Vand Raudales O(1976). The use of imprint technique for rapid diagnosis in postmortem examinations . American Journal of clinical pathology ,65, PP:(291 – 300).

12.Pouillart GM, Schlumberger Jrand Paintrand M.(1975). Cytology in the classification of diffuse non – leukaemic malignant lymphoma (lympho-and reticulosarcoma). British Journal of cancer , 31, PP:57 – 59.

13.Suen KC , wood WS. And syed AA(1988). Role of imprint cytology in intraoperative diagnosis value and limitations. Journal of clinical pathology, 31, PP:328 – 337.