RESEARCH ARTICLE

ROLE OF SCRAPE CYTOPATHOLOGY IN EARLY DIAGNOSIS OF NEOPLASTIC LESIONS & ITS HISTOPATHOLOGICAL CORRELATION

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ABSTRACT

Background: Scrape cytology is quick method to know difference between benign & malignant lesions hence aid in early diagnosis. This can in turn lead to quick management even intra operatively. This diagnostic discipline has arisen in parallel but much before contemporary histology.

Aims & Objective: (1) To establish scrape cytology techniques as a routine procedure for diagnosis of surgical specimen; (2) To evaluate the diagnostic accuracy of scrape cytological techniques in the diagnosis; (3) To study the merits and pitfalls of scrape cytological techniques in the diagnosis; (4) Correlations of findings of scrape cytology with histopathological findings.

Materials and Methods: This was a prospective study of 100 surgical specimens submitted in Department of Pathology, MGM Medical College, Indore. Smears obtained were stained with Papanicolaou Stain & studied.

Results: Out of total 33 benign lesions, 31 (94%) were diagnosed correctly and 1 (3%) was false negative & 1 (3%) was not correlating well with histology. Out of total 67 malignant lesions 60 (89.6%) were diagnosed correctly, 2 (3.0%) were false negative and 5 (7.4%) did not correlated with histology.

Conclusion: Scrape cytology is rapid technique for diagnosis & can be utilized in place of frozen section as well as adjuvant to histological diagnosis.

Key Words: Scrape; Cytology; Early Diagnosis; Surgical Pathology Comparison

Introduction

The development of "cytology" as a field of study in medicine required two basic and somewhat obvious pre-existing conditions. First, scholars had to discover (and believe) that there was such a thing as a cell and that cells of various types made up the bodies of all plants and animals. Second, diagnosticians had to be able to see those cells with some instrument--the microscope.[1-8] A diagnostic discipline has arisen in parallel but much before contemporary histology, which serves both screening and predictive function. Cytodiagnosis is a useful adjunct to histological diagnosis. Various modes of obtaining cytological materials are body fluids, FNAC of accessible lesions, imprint and scrape cytology from freshly biopsied specimen. Encouraging results have claimed cytodiagnosis as alternative to frozen section and conventional needle biopsies 10. In Europe, socialized medicine caused doctors to want to make diagnoses in the cheapest way possible--and a cytological aspirate was certainly cheaper than hospitalizing the patient and performing a surgical procedure to obtain a biopsy. Histology is the universally accepted means of establishing definitive pathological diagnosis; whereas the use of cytology is controversial. Although the histological appearance of a tissue is the final arbiter of diagnosis, the delay involved may at times affect the course of treatment. Moreover, not all hospitals can afford a full-fledged histopathology. Regarding scrape cytology though an open biopsy is essential for making a smear, the report is available immediately to the operating surgeon to take immediate decision.[10,11] In the scrape smear the morphological features are so well preserved that it is easy to make an accurate diagnosis. Scrape is far more superior to frozen sections because cellular morphology is very clear and a definite diagnosis can be made.[10] It is found that in all cases the cytology diagnosis correlated very well with histological diagnosis.

This study is undertaken with the aim that scrape cytology is a rapid, simple and easy technique for tissue diagnosis. This is an accurate diagnostic tool available to all practicing surgeon even in small hospitals and semi urban hospitals. It would greatly affect the planning of treatment of neoplastic disease and their course, even diagnosis can be given intraoperatively. This is an alternative simple procedure for frozen section or tru-cut needle biopsy. Present study was carried out on various surgical specimens. Smears were made from freshly cut surface and stained by Papanicolaou stain, studied for cellularity, crowding of cells, nuclear preservation, cytoplasmic preservation and background in order to establish a diagnosis.

Aims of the study: (1) To establish scrape cytology techniques as a routine procedure for diagnosis of surgical specimen; (2) To evaluate the diagnostic accuracy of

scrape cytological techniques in the diagnosis; (3) To study the merits and pitfalls of scrape cytological techniques in the diagnosis; (4) Correlations of findings of scrape cytology with histopathological findings.

Materials and Methods

The present work was carried out on various surgical specimens submitted in Department of Pathology, Mahatma Gandhi Memorial Medical College, Indore (MP).

Materials required were (i) New blade; (ii) Clear glass slides; (iii) Glass marking pencil; (iv) 95% alcohol; (v) Dry gauze / cotton. In each case we made a naked eye diagnosis from examination of the excised specimen before examining scrape cytology, after surgical removal, the lump was thoroughly inspected and palpated first as such and then it was bisected. A diagnosis of it being benign or malignant was recorded.

Technique for scrape smear: The scrape technique of Sidham et al (1984)[10] was followed: (i) The freshly cut surface of the unfixed specimen was first blotted with wet cotton to remove any excess blood or exudates. (ii) It was then scraped with end of the glass slide forming an acute angle with the cut surface to be sampled. (iii) The pressure applied for scraping and number of scraping movement needed to collect the material on the under surface of one end of the slide varied with the consistency of the specimen. (iv) The scraped material accumulated at one end of the glass slide was pressed between this slide and another slide. (v) The material was spread between these two slide by the movement of slide in opposite direction; this led to a loosening of the cells from cell groups and an opening up of architectural pattern as the cells were distributed as a single layer on the slide. (vi) Some were fixed immediately in 95% alcohol for Papanicolaou stain 9. The slides were then examined for evidence of malignancy, with attempted typing of any lesion found. Smears were seen first under low power then in high power then under oil emersion if necessary. Smears were examined and the findings of both techniques were correlated with those of histopathology reports.

The criteria considered for cytological diagnosis were clinical presentations, other investigations, gross examination and nuclear cytoplasmic character. Paraffin blocks were made accordingly. The sections were cut on microtome. The routine haematoxylin and eosin staining was used for histopathological study of the specimens.

Results

The present study comprises of total 100 surgical specimens submitted for histopathological examination in MGM Medical College, Indore (M.P.), we made scrape smear from various specimens and their diagnosis was correlated with histopathological diagnosis.

Table 1 shows result of scrape cytological diagnosis in benign and malignant lesions. Out of total 100 cases, 33 cases were benign and 67 cases were malignant Out of the 33 benign cases, 31 (94%) were diagnosed correctly and correlated histologically and 1 (3%) was false negative and one case was diagnosed as false positive. Out of the 67 malignant lesions 62 (92.5%) were diagnosed correctly and correctly correlated histologically, 1 (1.5%) was false negative and 4 (6%) did not correctly correlated histopathologically. Out of 100 cases, total 93 were diagnosed correctly so the total accuracy by combined approach was 93%, 2 cases (2%) were false negative and 4 (4%) cases were not correlated histopathologically whereas 1 case was diagnosed false positive (1%).

Out of total 33 benign lesions, 31 (94%) were diagnosed correctly and 1 (3%) was false negative. Out of 5 breast lesions, 4 (80%) were diagnosed correctly and 1 (20%) was not correlating well with histology. In 7 female genital tract lesions, all 7 (100%) were diagnosed correctly. In 8 male genital tract lesion all correlated well. Out of 6 thyroid lesions 6 (100%) were diagnosed correctly. Out of 05 soft tissue lesions 04(80%) were diagnosed correctly and 01 (20%) was false negative. All the lesions of salivary gland and kidney were diagnosed correctly.

Out of total 67 malignant lesions 60 (89.6%) were diagnosed correctly, 2 (3.0%) were false negative and 5 (7.4%) did not correlated with histology. In breast out of 22, 21(95.5%) were diagnosed properly and 1 (14.5%) did not correlated well with histology. In female genital tract out of 7 malignant lesions, 6 (85.7%) were diagnosed correctly. Out of 4 male genital tract malignant lesions included all were diagnosed correctly. Out of 8 gastrointestinal tract lesions, 7 (87.5%) were diagnosed correctly where as other 1 (12.5%) did not correlated well with histology. Out of 7 soft tissue malignant lesions, 6 (85.7%) were correctly diagnosed and 1 (14.28%) did not correlated well with histology. Out of 2 thyroid lesions 2 (100%) were diagnosed correctly. Out of 4 intraocular mass all 4 (100%) correlated well. Out of 2 malignant kidney lesions, 2 (100%) were diagnosed correctly. Out of 08 oral lesions, all 8 (100%) were diagnosed correctly. In 3 miscellaneous cases 2 (66.7%) diagnosed correctly and 1 (33.7%) was false negative.

Table-1: Cytological diagnosis in benign and malignant lesion

Lesion	Total	Correctly Diagnosed		False Negative		Not Correlated Histopathologically	
		No.	%	No.	%	No.	%
Benign	33	31	94	0	0	01	03
Malignant	67	62	92.5	04	06	01	1.5
Total	100	93	93	04	04	02	02

Table-2: Cytological diagnosis in various organ by scrape smear

Lesion	Total	Correctly Diagnosed		False Negative		Not Correlated Histopathologically	
		No.	%	No.	%	No.	%
Breast	27	25	92.6	0	0	02	7.4
FGT	14	13	92.8	0	0	01	7.2
MGT	12	12	100	0	0	0	0
GIT	08	07	87.5	0	0	01	12.5
Soft tissue	12	10	83.3	01	8.3	01	8.3
Thyroid	08	08	100	0	0	0	0
Salivary gland	01	01	100	0	0	0	0
Kidney	03	03	100	0	0	0	0
Oral lesions	08	08	100	0	0	0	0
Intraorbital lesion	04	04	100	0	0	0	0
Miscellaneous	03	02	66.6	0	0	01	33.3
Total	100	93	93.0	01	01	06	06

FGT: female genital tract; MGT: male genital tract; GIT: gastrointestinal tract

Table-3: Cytological diagnosis in different benign lesions

Lesion	Total	Correctly Diagnosed		False Negative		Not Correlated Histopathologically	
		No.	%	No.	%	No.	%
Breast	05	04	80	0	0	01	20
FGT	07	07	100	0	0	0	0
MGT	08	08	100	0	0	0	0
GIT	0	0	0	0	0	0	0
Soft tissue	05	04	80	01	20	0	0
Thyroid	06	06	100	0	0	0	0
Salivary gland	01	01	100	0	0	0	0
Kidney	01	01	100	0	0	0	0
Total	33	31	94	01	03	01	03

FGT: female genital tract; MGT: male genital tract; GIT: gastrointestinal tract

Table-4: Cytological diagnosis in different malignant lesions

Lesion	Total	Correctly Diagnosed		False Negative		Not Correlated Histopathologically	
		No.	%	No.	%	No.	%
Breast	22	21	95.5	0	0	01	14.5
FGT	07	06	85.7	0	0	01	14.3
MGT	04	04	100	0	0	0	0
GIT	08	07	87.5	0	0	01	12.5
Soft tissue	07	06	85.7	0	0	01	14.28
Thyroid	02	02	100	0	0	0	0
Intraocular mass	04	04	100	0	0	0	0
Kidney	02	02	100	0	0	0	0
Oral lesions	08	08	100	0	0	0	0
Miscellaneous	03	02	66.7	01	33.3	0	0
Total	67	62	92.5	01	1.5	04	6.0

FGT: female genital tract; MGT: male genital tract; GIT: gastrointestinal tract

Discussion

Considering the accuracy observed by different workers with our findings suggest, that if scrape smear are employed as adjuvant to histopathological study, it will be extremely useful in arriving the correct diagnosis. There are some points to improve the accuracy noticed by Dudgeon and Barrette (1934)[3], Tribe (1973)[2], Amarjeet Singh et al (1982)[11].

Benign

In the present series accuracy of scrape cytology in benign lesions was 94%. According to various sites accuracy in breast 80%, in female genital tract 100%, and in thyroid 100%. In male genital tract (100%) and in soft tissue lesion showed accuracy of 80%. Single case of traumatic neuroma was false negative. Sidham et al (1984)[10] found 100% accuracy in breast, male genital tract, female genital tract, soft tissue and 90.9% accuracy in thyroid and 1 case of false positive in thyroid lesions.

Malignant

Accuracy of scrape cytology in various malignant lesions was 92.5%. In the breast 95.5%, 85.7% in female genital tract, male genital tract 100%, 85.7% in soft tissue, 100% in kidney and 87.5% in gastrointestinal tract. Oral lesions had diagnostic accuracy of 100% and orbital mass also showed accuracy of 100%. Sidham et al (1984)[10] found 98.4% accuracy in malignant lesions, 100% in breast, testis, female genital tract, gastrointestinal and kidney 75% in prostate, 66% in thyroid.

In the present study, a single malignant lesion was false negative in scrape preparation. These cases emphasized that imprint and scrape smear are adjuvant to histopathology but cannot replace it. Histopathology is necessary for final diagnosis.

Conclusion

The information based on spatial inter relationships between cells and the three dimensional shape of individual cells, in situ carcinoma for example cannot be diagnosed by scrape smear. As it happened in a case of prostatic epithelial neoplasia was diagnosed as false negative. Another disadvantage of scrape is that a certain percentage of misdiagnosis occurs.

Despite these drawbacks it is concluded that scrape cytology is simple, fast, easy and reliable technique for the diagnosis of tumor. It has wide applicability in the rapid diagnosis of tumors of various body organs. In poor county like our which cannot afford a full fledge surgical pathological laboratory even at district level it is possible to give an opinion on the nature of tumor using these cytological methods. As this procedure takes only few minutes and it is possible to give diagnosis even intraoperatively. Scrape cytology although not a substitute for conventional histopathology, but as complementary to it, is useful for rapid diagnosis of malignant conditions as well as benign conditions.

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