

Original Article

Cytodiagnosis of Cutaneous Basal and Squamous Cell Carcinoma

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ABSTRACT

Background and Objective: Cutaneous cytology is the study of scraping or smears obtained from skin lesions. Although not commonly employed, cutaneous cytology has been a useful tool for clinicians due to simplified procedures and high sensitivity and specificity of presurgical clinical diagnosis of common types of skin tumors. This investigation was conducted to study usefulness of cutaneous cytology in diagnosis of basal and squamous cell carcinoma.

Methods: We collected 42 skin tumors in total, clinically presumed to be either BCC (n = 31) or SCC (n = 10). Samples were taken by the scraping technique. After smearing the cells onto several glass slides, they were fixed with 96% alcohol. The specimens were stained with Papanicolaou stain. Punch biopsies were taken to confirm the clinical and cytologic impression.

Results: Cytodiagnosis and histopathologic examination of 42 cases of BCC (n = 32) and SCC (n = 10) showed a significant concordance between histopathology of skin specimen and cytologic diagnosis with a sensitivity rate of 96.8% and specificity rate of 90% and with a high positive predictive value of 96.8%.

Conclusion: Cytologic examination is easy to perform, saves time, and provides a rapid and reliable procedure in diagnosis and confirmation of non-melanoma malignant skin tumors (BCC and SCC).

Key words: Skin, Cytology, Basal cell carcinoma, Squamous cell carcinoma

Introduction

Basal and squamous cell carcinoma are the most common skin cancers. Although they may be difficult to differentiate from other benign or malignant epithelial lesions, many of these tumors can be reliably diagnosed clinically (1,2). Cutaneous cytology is the study of scraping or smears obtained from the skin. It may be performed in numerous ways, normally; a scalpel blade is used to scrape the surface of the tumoral lesions of skin. Previously, the Tzank smear as a reliable and inexpensive method

has been used for diagnosis of bullous and vesicular dermatosis (3) and the utility of the examination of exfoliative cells for the diagnosis of atypic cells was first appreciated by George Papanicolaou (3).

Although not commonly employed, cutaneous cytology has been a useful tool for clinicians due to the development of simplified procedures and easy staining technique. This review reports the sensitivity and accuracy and positive predictive value of cytodiagnosis for cutaneous basal and squamous cell carcinoma.

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Materials and Methods

We performed a prospective study to evaluate the sensitivity and accuracy of cytologic examination in basal and squamous cell carcinoma. Samples from 42 cases (32 cases of BCC and 10 cases of SCC) were taken by scraping with a scalpel blade directly over the skin tumor surface. After smearing the cells onto two to three glass slides and fixing by alcohol 96%, the specimens were stained with the papanicolaou stain. With verrucous or hyperkeratotic lesions, the scraping was taken from the base or borders of the biopsy site during the surgical procedure. Histopathologic specimens were obtained with a 4 mm punch biopsy. The biopsies were fixed in 10% formaldehyde, routinely processed, and embedded in paraffin. Sections were stained with Hematoxylin and Eosin and the specimens evaluated by a pathologist.

Results

From a total of 42 cases of BCC (n = 32) and SCC (n = 10) of skin with simultaneous scraping cytology and punch biopsy that assessed in dependently majority cases, results of cytologic examination were matched with histopathologic diagnosis (Figures 1-2). X2 test showed a significant correlation between two diagnostic methods ($X^2 = 27.03$; $df = 2$; $p = 0$) (Table 1). The sensitivity of cytology in this study was 96.8% and its specificity was 90% with a high positive predictive value of 96.8%.

Table 1. Distribution of frequency cytology and histopathology diagnosis of skin lesion in patients

Cytology diagnosis	SCC		BCC	
	number	percent	number	percent
BCC	0	0	31	96.9
SCC	9	90	1	3.1
Others	1	10	0	0
Total	10	23.8	32	76.2

$X^2=27.03$; $df=2$; $p=0$

Discussion

Cytologic examination is an easy procedure that does not require anesthesia and saves time and provides a

rapid diagnosis in various tumoral lesions of body. This technique can be considered as a reliable method for the confirmation and differentiation of tumoral lesions. Exfoliative cytology is only occasionally used in clinical practice for diagnosis of skin tumors, especially BCC (2-3). This is despite its successful widespread use of this technique for cervical cancer. This technique offers many advantages. It is simple and cost-effective (2) and it provides a confirmatory diagnosis at the initial patient visit and may also be the sole conservative means of arriving at a pre-surgical diagnosis of skin tumors. Exfoliative cytology may be performed in numerous ways such as use of scalpel blade for scraping of skin lesions, use of swabs to obtain the material, imprint cytology, and preparing the first lesion by removing any visible crust (4,5). Many studies have used various staining for evaluation of glass slides of exfoliative cytology such as papanicolaou staining, methylene blue, Grunwald-Giemsa (6-8) and Diff-Quick stain (9). For fixing the glass slides, cytospray merchofix or absolute alcohol has been used (8). In this research study, we used scalpel blade for taking the sample and alcohol 96% for fixing and papanicolaou for staining the slides. The cytologic features for confirmation of skin malignant tumor and differentiation from benign lesions are an increased nuclear cytoplasm ratio, irregularity of nuclear membrane, irregularity of chromatin and nucleoli and nuclear molding. Although above criteria are of benefit for cytodiagnosis of malignant lesions, it is difficult to distinguish basal cell carcinoma from metastatic small cell carcinoma, merckel cell carcinoma, and other adnexal carcinoma (10,11).

Another limited capacity of cytology is to differentiate SCC from keratoacanthoma. Moreover, cytology does not give much information about tumor patterns or subtypes which can be related to aggressive behavior that can be very important in therapeutic decisions. Many studies issue the cytodiagnosis of cutaneous skin carcinomas and sensitivity and accuracy of this method. The most sophisticated study was carried out in Israel on 778 patients with benign and malignant skin lesions. The sensitivity rate for diagnosis of all benign lesions was 85.9 percent and predictive value for diagnosis of malignant lesions was 91.3 % and for pre-malignant lesions was 64% (11).

Another study on 150 skin lesions compared histopathologic examination and correct cytodiagnosis was obtained in 89 % of cases (12). Cytologic efficacy and sensitivity was 98% and 90.9% in another study on 66 palpable skin lesions (13). Various research

articles also in their studies introduced cytodiagnosis of skin lesions as a rapid, accurate and reliable method for clinical practice (3, 7, 14,15). In our study that was performed on 42 cases of BCC and SCC, the sensitivity and specificity of cytology for diagnosis of these skin tumors were 96.8% and 90% respectively and Fischer statistical analysis showed a significant relationship between cytology and histopathology.

Conclusion

We believed that although cytology is a rapid and reliable diagnostic procedure of skin tumors, especially for BCC and SCC, but it is not enough as a single test and should always be followed by histopathologic confirmation before any therapeutic option is considered.

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