# *Qualification of abrasive cytology in the diagnosis of maxillofacial skin and mucosal disorders*

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ABSTRACT

**Background.** A variety of lesions ranging from so-called sebaceous cysts to malignant primary tumors and metastases may be observed in the maxillofacial skin and oral mucosa. We attempt to apply abrasive cytology for diagnosing lesions in the maxillofacial area.

**Materials and methods.** A study of the cytological findings of forty-three abrasions is reported. A Medscand's cytobrush was used to obtain the material. 35 lesions developed in the maxillofacial skin and 8 on the oral mucosa.

**Results.** Out of these 43 lesions, 34 were reported as malignant, (32 as basal-cell and squamous-cell carcinomas, 2 as metastatic adenocarcinomas from the lung and the prostate), 8 lesions were benign, while one was inconclusive. Histopathology confirmed 41 cytodiagnoses, one was a false positive case, calcifying epithelioma of Malherbe. Results were evaluated in respect to accuracy, sensitivity, and specificity.

**Conclusions.** Abrasive cytology is suggested as the first choice for the clinical evaluation of lesions arising in the maxillofacial skin and oral mucosa. An adequate experience in cutaneous cytopathology is however essential.

KEY WORDS

**abrasive cytology, maxillofacial lesions, histology**

## *Introduction*

Cytological evaluation of cutaneous and mucosal tumors presents a diagnostic challenge. Preoperative diagnosis is of great importance for the right choice of treatment, in the maxillofacial surgery. The recognition of the lesions may be accomplished by clinical, radiological, cytological and histopathological examination. Cytological examination of cutaneous tumors is not as yet a well recognized modality (1,2), due to the fact that surgical excision and biopsy are easy to perform. *Cytology* is a simple diagnostic approach useful both to the patient and to the surgeon, as offers a quick result. It is indicated in cases which can be managed either by radiotherapy (3) or local (intralesional) interferon treatment (4,5). Surgery may not be_desirable in old persons under systemic therapy or in patients with multiple lesions where extensive skin allograft is needed.

The most common malignant tumors are squamous-cell carcinomas (SCC) and basal-cell carcinomas (BCC).

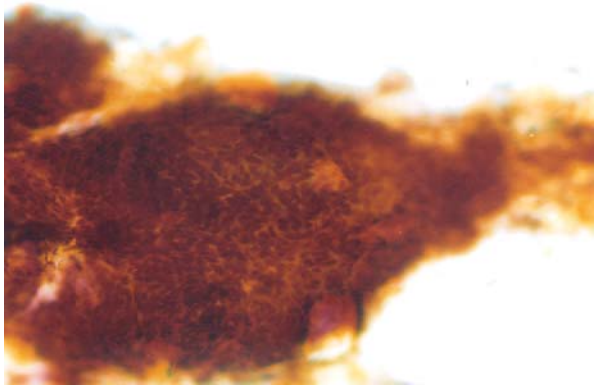

Figure 1. Calcifying epithelioma of Malherbe misdiagnosed as BCC. Abrasive cytology, Papanicolau stain 40x.

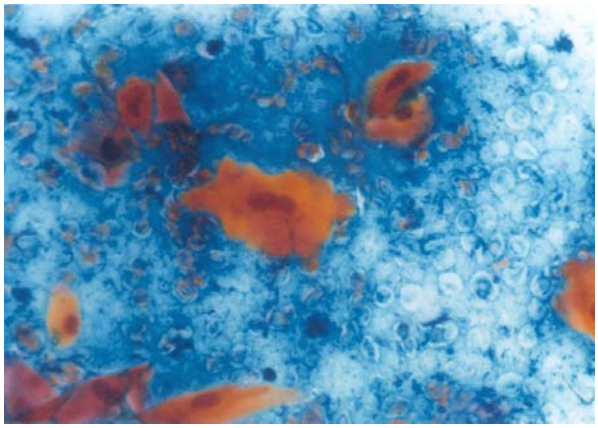

Figure 3. SCC misdiagnosed as Keratoacanthoma. Abrasive cytology Papanicolau stain 40x (the inconclusive report).

Canti in 1979, published a study of 1628 BCCs using scraping cytology and obtained satisfactory results (6). This must be stressed, because in the 1979 study, the percentage of sampling inadequacy was high, due to small exfoliation of cellular elements. Our setting investigated the diagnostic accuracy, specificity and sensitivity of abrasive cytology in maxillofacial skin and mucosal tumors, in our center.

## *Materials and methods*

Forty-three abrasions of skin and mucosal lesions in the maxillofacial area, were obtained and routinely processed. in the Cytology Department, Regional Hospital of Alexandroupolis, during the last twelve months.

On clinical examination the lesions presented in most cases as ulcers or an exophytic mass. In a few instances the lesion was flat and red-gray surrounded by a small halo. The 16 lesions were localized on the cheeks, 2 on the ears, 3 on temples, 5 on the neck, 6 on the nose, 3 in the nose-cheek groove, 3 on the lips, 3 on the tongue and 2 on the alveolar ridge.

We used the *Medscand's cytobrush method*. The material was obtained in a similar way as gynecologists take material from the endocervical canal.

We applied the Giemsa quick 1 minute staining method (Hemacolor, Merck, Germany) to decide the adequacy of samples. If necessary the sampling was repeated. Subsequently, smears were stained with May-Grünwald-Giemsa (MGG) and Papanicolaou (Pap) stains.

Expertly prepared smears, proper fixation and staining techniques are the *conditio sine qua non* for optimal diagnostic results.

Accuracy, specificity and sensitivity of abrasive cytology were calculated by the following mathematical forms:

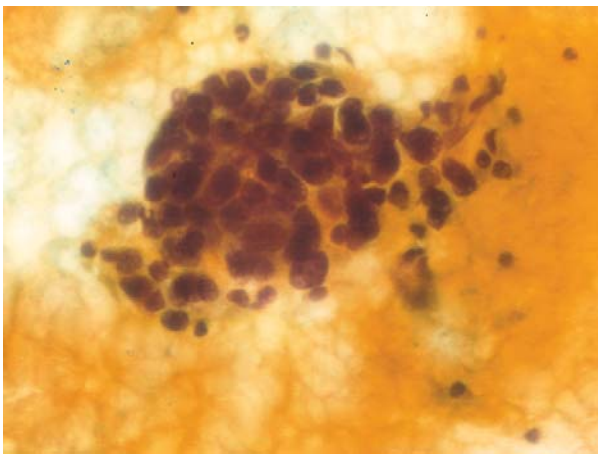

Figure 2. SCC arising on the upper lip. Abrasive cytology, Papanicolau stain 40x.

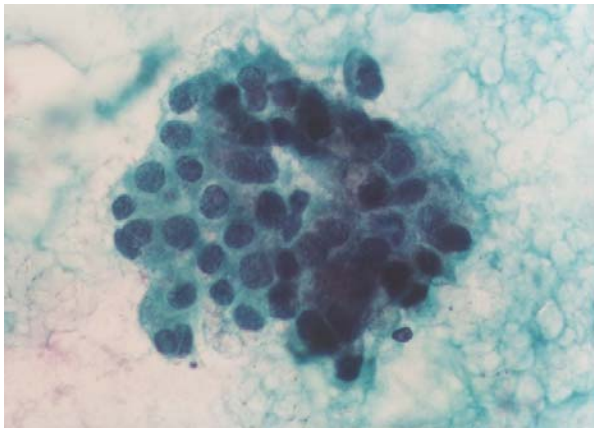

Figure 4. Metastatic adenocarcinoma from the prostate gland. Abrasive cytology, Papanicolau stain 40x.

$$\text{Diagnostic accuracy} = \frac{TP+TN}{TP+TN+FP+FN}$$

$$\text{Sensitivity} = \frac{TP}{TP+FN}$$

$$\text{Specificity} = \frac{TN}{TN+FP}$$

TP= True Positive, TN= True Negative, FP =False Positive, FN =False Negative.

# *Results*

Out of 43 samples examined by cytology, 34 were reported as malignant (figures 2-4), 8 as benign, while one case was inconclusive. The differential diagnosis in question was between keratoacanthoma and SCC of the lip, the histopathological diagnosis was SCC (figure 3). One lesion on the nose was cytologically interpreted as BCC, but the histopathologic diagnosis revealed calcifying epithelioma of Malherbe (figure 1).

From these values we concluded that the *diagnostic accuracy* was *97.67 %* with a *100 % sensitivity* and a *specificity of 88 %.*

We conclude that: 1) a (positive and negative) cytology report is 97.67 % a true (positive and negative) report, 2) a positive cytology is 100 % correlated with a positive histology, and 3) a negative cytology is 88% correlated with a negative histology.

# *Discussion*

The Medscand's cytobrush method (abrasive cytology), we have applied, proved to be an accurate method for diagnosing benign and malignant lesions. It can usually detect a malignancy and play an important role in the preoperative investigation of primary as well as metastatic skin tumors. In our study, there were two metastatitic tumors, an adenocarcinoma primarily arising in the lung and another from the prostate.

The usefulness of cytodiagnosis in primary cutaneous malignant tumors such as SCC and BCC is well documented (7,8) . The authors share such opinion, as they missed only one diagnosis, the case of calcifying epithelioma of Malherbe. They believe that once obtaining the necessary experience, false positive or false negative diagnoses can be kept at minimum. Cytodiagnosis is indicated in cases of rapid diagnostic demand as well as in suspected recurrences. However, cutaneous cytopathology has its limitations It has to be stressed that a negative cytodiagnosis in certain cases should be judged with caution, because the nature of the lesion itself doesn't permit adequate sampling. This can happen in lesions with dense connective tissue stroma, in new lesions with few neoplastic elements, in superficial lesions, or inadequately treated lesions.

A strong limitation of the cytological evaluation concerning SCC, is the unability to grade the neoplasm's according to Broders (1921) or according to Edmondson (1948). Since the majority of malignant tumors are moderately differentiated, grading is of limited value and TNM staging is considered to be of far greater value.

Sometimes the differential diagnosis must be made between BCC, psoriasis, eczema, and Bowen's disease, especially when the lesions are diffuse, superficial, and not sharply demarcated from the normal skin. BCC must also be separated from tropical leismaniasis especially in the Ionian Islands, from glomus tumor, a pigmented nevus, pyogenic granuloma, melanoma and SCC. A simple cytological examination may be of helpful in the above cases (8). Cutaneous metastases may result from any neoplasm (9). Cytology can detect metastases in patients with a documented neoplasm during the follow-up.

It has to be stressed that only lesions suspected for neoplasia should be selected for sampling: Less suitable are lesions in which tissue architecture is of paramount importance for an accurate diagnosis. Cytology has its place in a well defined protocol; it has little to offer in terms of taxonomic diagnostic accuracy. However there are some benign skin lesions which can be cytologically diagnosed (10).

Cytodiagnosis may be indicated where radiotherapy or intralesional interferon injections are planned, in elderly persons to avoid biopsy or in cases of multiple lesions where an extensive skin allograft is foreseen.

Intralesional interferon treatment was reported by Greenway et al (5) in the treatment of certain type of BCCs and is still used.

# *Conclusion*

According to the authors' experience abrasive cytology is indicated as the first choice technique for the clinical evaluation of lesions arising in the maxillofacial skin and oral mucosa.

They point out that the method is reliable and rapid . According to these advantages it is suggested that it should be included into today's state of the art in the field of maxillofacial surgery. A strict cooperation between clinicians and cytologists could increase the accuracy beyond the 97,67%.

### *Acknowledgements*

Acknowledgements: We thank the technician Bachtsevanidou Agorasti for her contribution.

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