Case Report

iMedPub Journals
www.imedpub.com

Annals of Clinical and Laboratory Research
ISSN 2386-5180

2021
Vol.9 No.11:380

DOI: 10.36648/2386-5180.9.11.380

Cytology of Oral Squamous Cell Carcinoma Case Reports and Short Review

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Citation: Nitheash P, Mithun KM, Suresh BS, Suma MS, Mathew AK (2021) Cytology of Oral Squamous Cell Carcinoma Case Reports and Short Review. Advanced Rectal Cancer. Vol.9 No.11:380

Abstract

Oral exfoliative cytology is a simple yet a powerful tool for early detection of potentially malignant disorders of the oral mucosa as well as for some viral and fungal infections that involves the use of inexpensive instruments. The proper role of oral cytology in cancer diagnosis and detection has been studied by many researchers. Analysis of recent investigations confirms that the smear technic gives excellent results although not a substitute for biopsy, is an accurate diagnostic adjunct for the early detection of oral cancer. The use of oral exfoliative cytology in clinical practice declined due to the subjective nature of its interpretation, because there may be only a small number of abnormal cells identifiable in a smear. The more recent application of quantitative techniques has refined the potential role of cytology, stimulating a reappraisal of its value in the diagnosis of oral cancer. These studies indicate that oral cytology may provide an important adjunct in the assessment of the patient with a potentially cancerous oral lesion.

Keywords: Oral Exfoliative Cytology, Oral Cancer

Received: October 05, 2021, **Accepted:** November 18, 2021, **Published:** November 25, 2021

Introduction

The most common type of cancer affecting the oral cavity and oropharynx is squamous cell carcinoma of epithelial origin which is estimated to constitute approximately 94% of all oral malignancies [1]. Recent changes in the traditional risk factors have greatly altered the approach to prevention, diagnosis, treatment, and prognosis. It is evident that head and neck cancer, which carries an overall death risk of 54%, represents a serious and dynamic global health problem [2]. George N Papanicolau in 1941 was first the who applied cytodiagnosis in routine practice and he also developed PAP stain that is routinely used in the cytology lab.

Its application in oral cancer has been known for a long time. It has been stated in a review that von Hamm cited numerous cases of patients with oral cancer in which the diagnostic accuracy of the cytological smear when compared with biopsy found to be identical [3].

In oral cavity, the squamous epithelial cells usually exfoliate as routine physiological process and underlying cells of the epithelium stays intact. These cells are collected by scrapping the buccal mucosa and smear is prepared. However, in case of pathological condition, underlying cells of the epithelium loose adherence and also sheds along with the superficial cells [3,4]. These exfoliated cells are scrapped off by means of specific instruments, smeared and stained (PAP stain) which can be studied quantitatively or qualitatively [3,4].

Case Reports

Case 1

A 32 years old male patient came to the Department of Oral Medicine & Radiology with a chief complaint of ulcer and pain over the tongue and having difficulty in having food for past 15 days. The patient has a habit history of pan chewing and smoking for past 1 year. On examination a chronic non healing ulcer were seen over the left lateral border of the tongue which is measuring about more than 2.5 cm x 1.5 cm approximately. The ulcer has rolled and indurated margins. The adjacent submandibular lymph nodes are hard and fixed. Smear were taken and fixed and sent for PAP staining (**Figure 1**).

The PAS stained smear when viewed in low power magnification (10x) shows epithelial cells that are predominately scattered as well as arranged in group's giving a clustered appearance admixed with hemorrhagic components within the eosinophilic background. In higher power magnification (40x), the epithelial cells predominantly exhibit moderate to severe stage of dyskaryosis that are enumerated by the features of pleomorphic

Figure 1 The clinical-photograph shows a non-healing ulcer over the lateral border of the tongue and also patient had limited mouth opening.

vesiculated nucleus and nucleolus with hyperchromasia. The cytoplasm is less evident as a thin margin with irregular cellular membrane. Other highlightening features include increased mitotic activity and an increased nuclear to cytoplasmic ratio with few them undergoing keratinization. A mixed inflammatory cell infiltrate is seen indicated by the presence of lymphocytes and monocytes predominately along with few plasma cells and multinucleated giant cells in focal areas. The impression for the cytology smear is given as Class V smear (**Figure 2 and 3**).

Case 2

A 40 years old male patient came to the Department of Oral Medicine & Radiology with a complaint of pain in the lower right back tooth region. On examination a chronic non healing ulcer is seen over the right buccal vestibule. Adjacent submandibular lymph nodes are fixed. Smear is taken, fixed and sent for PAP staining (**Figure 4**).

The PAP stained smear when viewed in low power magnification (10x) shows epithelial cells that are scattered and as well as arranged in group's admixed with hemorrhagic infiltrate seen within the eosinophilic background. In high power magnification (40x), the epithelial cells display moderate to severe stages of dyskaryosis that are determined by the features of pleomorphic nucleus with a large size nucleolus, hyperchromatic and increased nucleus to cytoplasmic ratio. The cytoplasm is dense eosinophilic as well as less distinct with or without regular or irregular cellular membrane. The mixed inflammatory cell infiltrate is seen that denoted by the presence of numerous polymorphonuclear neutrophils and lymphocytes predominately and with the presence of monocytes in focal areas. The impression for the cytology smear is given as Class V smear (**Figure 5 and 6**).

Case 3

A 40-year-old male patient came to the Department of Oral Medicine & Radiology with a complaint of pain in the lower right back region. Patient has a history of chewing habit, consumption of smokeless tobacco for the past 15 days that was consumed for 5-6 times a day. On examination the patient has a restricted mouth opening. There is a diffuse chronic ulcerative lesion is seen over the retromolar area (right side) with pesudomembraneous slough. The borders of the lesion are elevated, rounded and indurated measuring about greater than 5 cm approximately. Lesion is tender on palpation. Submandibular lymph nodes are fixed. Smear is taken from retromolar area (right side) and PAP staining done (**Figure 7**).

The PAP stained smear when viewed in low power magnification (10x), shows numerous epithelial cells where few of them exhibits keratinization. The cells are scattered as well as arranged in group's seen within the eosinophilic background. In higher magnification (40x), exhibit severe dyskaryosis that are highlighted by the features of nuclear pleomorphism and hyperchromasia with regular or irregular nuclear membrane, nucleoli or nucleolus are distinct with chromocenters, an increased nuclear to cytoplasmic ratio, increased mitotic activity and the presence of atypical mitotic figures. In addition to these changes, there are also features of necrotic changes of the nucleus that are enumerated by karyosis, pyknosis and karyorrhexis. Some epithelial cells in focal areas show eccentrically placed nucleus, presence of binucleated and multinucleated cells, presence of apoptotic bodies and some are larger giving a lobulated appearance. A mixed inflammatory cellular infiltrate is seen with presence of neutrophils, lymphocytes, monocytes, macrophages and few plasma cells. The impression for the cytology smear is given as Class V smear (**Figure 8 and 9**).

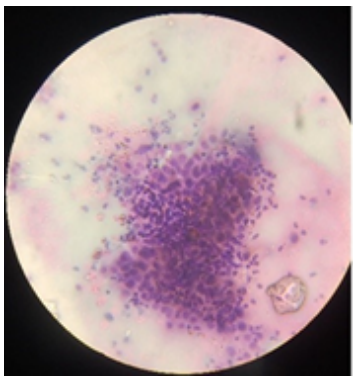

Figure 2 The photomicrograph (10x) shows PAP stained smear of characteristic malignant cells.

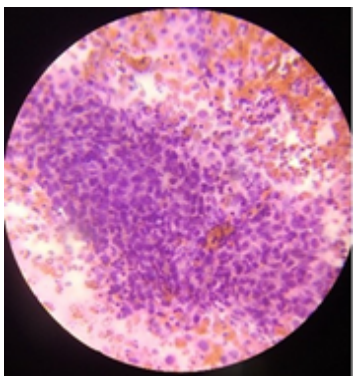

Figure 3 The photomicrograph (10x) shows PAP stained smear of characteristic malignant cells.

Figure 4 The clinical-photograph shows the lesion is seen over the right buccal vestibule.

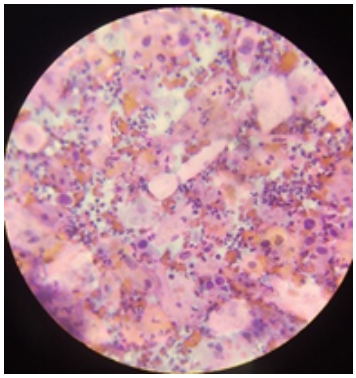

Figure 5 The photomicrograph (10x) shows PAP stained smear of characteristic malignant cells.

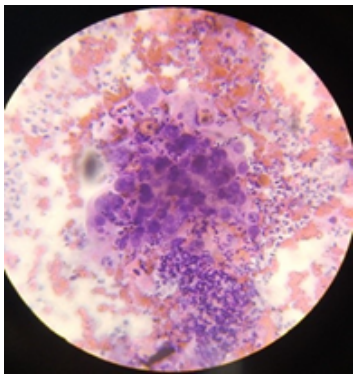

Figure 6 The photomicrograph (10x) shows PAP stained smear of characteristic malignant cells.

Figure 7 The clinical-photograph shows the lesion is seen over the retromolar area and also patient has limited mouth opening.

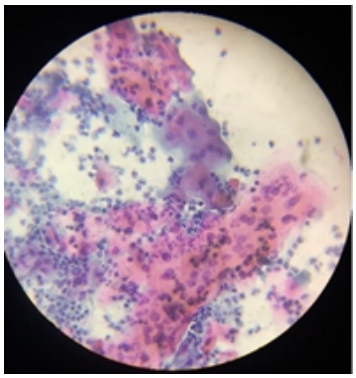

Figure 8 The photomicrograph (10x) shows PAP stained smear of characteristic malignant cells.

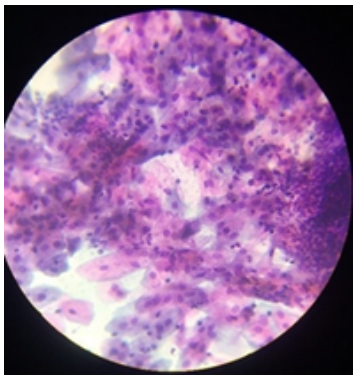

Figure 9 The photomicrograph (10x) shows PAP stained smear of characteristic malignant cells.

Discussion

Exfoliative cytopathology is the study of normal and disease-altered, spontaneously exfoliated, or mechanically dislodged cells for the detection and diagnosis of various infections, and precancerous or cancerous lesions [5]. Oral exfoliative cytology can be a powerful tool for early detection of malignant and premalignant lesions as well as for some viral and fungal infections [6]. Cytology is not considered a substitute to surgical biopsy but act as an adjunct. It is relatively simple, painless and bloodless procedure which check against false-negative biopsies. It is valuable for screening lesions as well as helpful in follow-up [3]. It's use dependent upon the proper preparation of the smear and better evaluation. The cytology report usually framed in these classes: Class I normal; Class II mildly atypical but benign; Class III indeterminate; Class IV suggestive of cancer; and Class V positive for cancer [6]. Though has a significant role in cancer diagnosis, it has its own limitations. It cannot assess the extent and invasion and the cells cannot be studied in their proper tissue relationships to one another [6]. It should be remembered that a negative cytology report does not rule out cancer and a repeat smear or biopsy is indicated in all clinically suspicious lesions [7,8]. Apart from the diagnosis it has widespread research applications those includes many quantitative and qualitative studies as well as application in forensic odontology [3].

Conclusion

The preparation of oral exfoliative cytology cells is a simple technique yet a powerful procedure in early detection of few potentially malignant and malignant lesions as well as study of microbial infection. It should be a part of routine investigating procedure and to be implement in routine practice.

Declarations

Consent form: The authors certify that they have obtained all appropriate patient consent forms and efforts are made to conceal their identity.

Funding

No funding sources

Conflict of interest

There is no competing of interest

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