

CHANGES IN THE ORAL CAVITY OF A PATIENT AFTER SUFFERING FROM CORONAVIRUS INFECTION COVID-19: A CLINICAL CASE

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ABSTRACT

Introduction: Oral lesions are the result of a systemic condition after COVID19.

Materials and methods: This article describes a clinical case of dental manifestations in a young woman after suffering from a viral infection with COVID-19. Dental examination, consultation and determination of salivation were performed after the previous infection and treatment.

Results: Changes in the oral cavity appeared on the 3rd week of the disease and showed no reverse dynamics at the time of the dental examination. Dryness in the oral cavity and burning tongue were the main complaints, and clinical manifestations took the form of exfoliative cheilitis, petechiae on the buccal mucosa and desquamative glossitis.

Conclusion: Importance of a dentist as part of a multidisciplinary team in diagnostics and treatment of COVID-19 was noted.

Keywords: dryness, COVID-19, oral mucosa, petechiae.

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Introduction

Today, the topic being most discussed, both in the medical and non-medical society, is the outbreak of the viral infection COVID-19, which within a short time has developed into a pandemic that has engulfed most countries of the world⁽¹⁾. A distinctive feature of this infection is that it has no pathognomonic signs, although similarity of symptoms in most patients is still observed. The main manifestations of the virus COVID-19 are very similar to influenza, namely: elevated body temperature, catarrhal manifestations, weakness, muscle pain. One of the most common complications is viral pneumonia, which leads to breathing difficulties⁽²⁾. Besides, it is known that most cases of the disease proceed with taste perception change and loss of smell. Recently, there have been reports of the impact of the

virus COVID-19 on the health of organs and the oral cavity tissues⁽³⁾. It is possible that oral lesions are the result of a systemic condition, however, they can also be manifestations of adverse reactions to treatment. Therefore, the spectrum and the course of COVID-19 manifestations in the oral cavity are of wide and urgent interest.

The main purpose of this article is to analyze a clinical case with manifestations in the oral cavity in a patient after suffering from COVID-19.

Ethical statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee, and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained.

Case report

A clinical case of a patient, 38 years old, who works as a nurse in a medical institution, and noticed the dental symptoms after suffering a coronavirus infection, is here described. The main complaint when referencing a doctor was an unusual tongue appearance and burning sensation, intermittent bleeding of gums, severe dryness in the oral cavity and persistent distortion of taste. The patient does not smoke, does not consume alcoholic beverages and has no concomitant somatic pathology.

The patient stated that the first clinical implications were noticed on 01.09.2020 and looked like the acute respiratory syndrome manifesting as rhinorrhea, coughing and increased body temperature to 38.5°. On the third day, the increased body temperature dropped to 36.5°, however, taste distortion (dysgeusia) appeared that was later followed by the changed smell function (anosmia). Other clinical symptoms that raised concerns were severe weakness, heart palpitations, headache, decreased visual acuity, shortness of breath.

The patient was tested several times, however, the RT-PCR test results turned to be negative (testing was done using the SARS-CoV-2 test). Testing for SARS-CoV-2 IgM antibodies gave a positive result (testing was done by chemiluminescence immunoassay method). Tomographic data - CT signs of 2-sided polysegmental viral pneumonia. D-Dimer values = 1.85 (when the norm is less than 0.5 ng/l), highly sensitive C-reactive protein = 4.86 (when the norm is less than 1.0), saturation is reduced. The established diagnosis is community-acquired bilateral pneumonia, clinical group 2 (Covid-19), pulmonary insufficiency, stage 1. Disability certificate was issued for 30 days. Prescriptions for the diagnosis of viral pneumonia: Dexamethasone 8 (subsequently 4) mg i/m, once a day, Levaxela (750 mg, once a day), Clexane 0.4, 2 times a day, Vitamin C 500 mg, Vitamin D 20,000 doses, Zinc 75 mg a day, Famotidine 40 mg a day. At the time of discharge, the blood test showed $PLT = 170 \cdot 10^9/l$ (norm 180 - 320), $PCT = 0.139/l$ (norm 0.200 - 0.500).

Dental manifestations in the form of dryness in the oral cavity, as a permanent symptom, appeared on the 5th - 6th day of the disease, and, according to the patient, practically did not decrease to date. At the beginning of the 3rd week of illness, the patient noticed burning sensation and an unusual pattern on the tongue, gum reddening and its bleeding when brushing teeth and eating.

Examination revealed a dry red border of the lips, with scale-crusts tightly adhered to the surface in the center and free at the edges; when the edge of the scales was pulled back, an erosive surface was revealed (Fig. 1).



Figure 1: Dental photograph of the patient I. at the time of the dental examination. The red border of the lower lip is covered with scales and crusts tightly adhered to the surface.

The mucous membrane of the oral cavity was dry, edematous, dull, in the area of the mucous membrane on the right cheek multiple lesions were found in the form of whitish spots, which merged into larger ones (Fig. 2a). The lesions did not rise above the level of the surrounding mucous membrane, did not have any hyperemic base, were painless on palpation, did not remove and did not change color when scraped with an instrument.



Figure 2a: Dental photograph of the patient I. at the time of the dental examination. Small whitish spots that do not rise above the oral mucosa.

Besides, a pronounced vascular-capillary pattern was observed. It should be noted that these formations were found only on the right side, while the mucous membrane on the left did not have the indicated pathological elements (Fig. 2b).

Special attention was drawn to the condition of the dorsal and lateral surfaces of the tongue, which caused problems to the patient due to pronounced burning sensation and an unusual appearance (Fig. 3).



Figure 2b: Dental photograph of the patient I. at the time of the dental examination. Mucous membrane of the left cheek. In addition, on the mucous membrane of the cheeks closer to the transitional fold, single point petechiae were found.



Figure 3: Dental photograph of the patient I. at the time of the dental examination. Alternating areas of keratosis and desquamations are noticed on the tongue.

The tongue was enlarged, pale, with irregular areas of hyperkeratosis and desquamation in the form of rings and half rings. The fungiform papillae were thickened and enlarged, the filiform papillae in the lesions were smoothed. It should be noted that palpation of the tongue was painless.

During examination, it was noticed that the mucous membrane was slightly moistened, when touching the mucous membrane, the instrument adhered to its surface. In the retromolar space, there was an accumulation of viscous sticky foamy white saliva. In order to study the correspondence between subjective sensations of dryness in the oral cavity and objective manifestations, the rate of unstimulated salivation was measured according to the standard method (passive spitting of mixed saliva into a graduated tube followed by measuring the amount of secretion per 1 minute). The result obtained revealed hyposalivation (0.15 ml/min) with normal values in the range of 0.3 - 0.6 ml/min, as well as increased viscosity of the oral fluid (4.3 relative units).

Discussion

The available few and scattered literature data still do not give an unambiguous answer to the question of whether the manifestations in the oral cavity are the result of the direct action of the virus or they arise as a result of the side effects of medicines taken by patients. According to the described clinical case, as well as reports found in the literature, it is known that dysgeusia and ageusia, anosmia may be the first manifestations of COVID-19⁽⁴⁾. The pathogenetic mechanism of these disorders still stay not fully studied and understood, however, it is assumed that high expression of angiotensin-converting enzyme 2 (ACE2) on epithelial cells of the tongue and salivary glands, which is the object for SARS-CoV-2 to bind, is the basis⁽⁵⁾. It is possible that infection with SARS-CoV-2 leads to dysfunction of the salivary glands, impaired saliva outflow, which causes tissue hypoxia, damaging them, which leads to a registered taste disturbance⁽⁶⁾. In the described clinical case, it was noted that the patient had single-point hemorrhages (petechiae) on the cheek mucosa. The lesion elements were painless, single-point, and located closer to the transitional fold. The presence of petechiae is presumably associated with thrombocytopenia, which occurs when the virus acts on the vascular wall, and as a result of the use of Clexane and other anticoagulants⁽⁷⁾. Saliva is known to be an important component in maintaining oral health, playing an essential role in keeping structural and functional balance^(8,9). The protective role of saliva lies in moisturizing tissues, removing desquamated epithelium and food debris, participating in local immune reactions, endocrine regulation, trophic processes, and digestion. Decrease in the amount or absence of saliva directly affects the dental quality of life of patients.

With hyposalivation, there are disturbances in taste, burning sensation in the mouth, and taste distortions. This can result in psychological disturbances and a range of social problems that reduce the quality of life. The final mechanism for reducing salivation in COVID-19 is unknown, however, we assume that the reduced salivation rate and increased viscosity of the oral fluid observed in our study are associated with the side effect of simultaneous administration of a large number of medicines that are usually prescribed for treatment of the coronavirus infection, i.e. are the consequence of drug polypharmacy. Taking such medicines, especially long-term, disrupts the balance of

microflora, affects sympathetic and parasympathetic regulation, and consequently can cause development of dryness in the oral cavity. Besides, direct neuroinvasive and neurotropical action of the virus in patients with COVID-19 cannot be ruled out.

During the literature search in preparation to writing this article, we came across the results of a study that described extensive gum pigmentation in the anterior part of the mouth, as well as on the labial surfaces in a patient with COVID. The authors explained such changes by the fact that immune-inflammatory processes were associated with hyperpigmentation of melanin in the oral mucosa⁽¹⁰⁾. Various factors produced during inflammation such as prostaglandins, leukotrienes, cytokines and inflammatory mediators may play their role in the response and in enhancing melanogenesis. Inflammatory mediators such as histamine and arachidonic acid metabolites trigger melanogenesis⁽¹¹⁾, while inflammatory cytokines such as TNF- α and IL-1 α induce secretion of melanogenic agents (SCF, HGF, bFGF, endothelin) by keratinocytes⁽¹²⁾. All of the above indicates that COVID-19 is represented in the oral cavity by a wide range of non-specific clinical manifestations.

Conclusion

For the patients that are currently suffering from COVID-19 and those who have already recovered, we should consider the presence of oral signs and symptoms, including dysgeusia, petechiae, candidiasis, aphthae, xerostomia, desquamative glossitis, and others.

It is also required to underline importance of a dentist as part of a multidisciplinary team to support the health and quality of life of patients both during and after COVID-19. The long-term dental follow-up after a patient has suffered from COVID-19 is to be ensured. Thus, better understanding the course of this pandemic infectious disease requires further research, including studies of dental manifestations in patients with COVID-19.

Key messages

This clinical case remained under our control. To alleviate the symptoms associated with impaired salivation, individual algorithm was developed for the patient. It was consisting of home oral hygiene with the selection of hygiene products and items. Additionally, an oral moisturizer (gel) containing betaine, taurine, sodium hyaluronate, xanthan gum,

caragenan, xylitol, hydrogenated castor oil, hyaluronic acid, stevia rebodian extract, CI 19140, CI 42090 flavor were recommended. The patient reported that within 1.5 months all dental symptoms disappeared.

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