



## Post COVID Oral and Periodontal Manifestations: Truth or Myth?

Dr. Rajesh Prabhakar Gaikwad, Dr. Akshaya Bhupesh Banodkar, Dr. Lynette Custodio Fernandes, Dr. Vaibhavi Pandurang Nandgaonkar, Dr. Priyanka Ganpatrao Awasare

<sup>1</sup>Professor and Head of Department of Periodontology, Government Dental College and Hospital, Mumbai, Maharashtra

<sup>2</sup>Associate professor, Department of Periodontology, Government Dental College and Hospital, Mumbai, Maharashtra

<sup>3,4,5</sup>Post Graduate Student, Government Dental College and Hospital, Mumbai

Corresponding Author: Dr. Lynette Custodio Fernandes

Submitted: 10-04-2022

Accepted: 21-04-2022

### ABSTRACT:

**Background:** The novel Corona virus pandemic engulfed the entire world in its midst. The virus shows various signs and symptoms of fever, headache, diarrhoea, malaise and oral manifestations like loss of taste sensation as well. Hence, in the present scenario, the role of dentists is ever more increasing. The Angiotensin Converting Enzyme Receptors, associated with the pathogenesis of the virus, are located at various positions in the oral cavity, due to which the oral cavity gains a prominent role in association with the virus. In this case report, we aim to evaluate, the Post COVID oral and periodontal manifestations in 3 patients.

**Methods:** Patients who had a history of COVID, diagnosed with COVID and underwent treatment were selected. The patients were chosen from the Out Patients Department, of the department of Periodontology, Mumbai. The detailed case history and clinical examination of the patient was carried out adhering to the guidelines of the Central Health Ministry.

**Conclusion:** Various intraoral findings were observed in the Post COVID patients in this case report. The findings could be chance occurrences and many more patients need to be observed to verify the relation between the oral cavity, periodontal condition and COVID.

**Keywords:** manifestation; oral; periodontal; COVID

### I. INTRODUCTION

The novel Coronavirus belongs to a family of single-stranded RNA viruses known as Coronaviridae. This family of viruses are known to be zoonotic or transmitted from animals to humans.

These include severe acute respiratory syndrome coronavirus (SARS-CoV), identified in 2002, and the Middle East Respiratory Syndrome coronavirus (MERS-CoV), identified in 2012.

This virus was first identified in Wuhan, China, and has spread throughout, engulfing the world in its midst. Till date, this deadly pandemic has affected billions of people, all around the globe.<sup>2</sup>

Patients affected with this virus, show symptoms of fever, fatigue, myalgia, dry cough, sore throat and headache. Newer symptoms of loss of taste (Dysgeusia), smell, diarrhea and vomiting have also been observed.<sup>3</sup>

The WHO has stated that a possible mode of transmission of the virus does occur through saliva droplets.<sup>4</sup>, making the oral cavity an important area associated with the spread of the virus. The role of the oral cavity in the entrance and pathogenicity of the virus is controversial. Certain reports by Herrera et al(2020), (Xu et al., 2020) suggest a role of the oral mucosa in the diagnosis and etiology of COVID 19.<sup>4,5</sup> It was suggested in literature that the possibility of the oral cavity being a potential site of infection could be due to reasons such as, the salivary gland harboring the virus, detection of the ACE receptors associated with the virus on the oral cavity and the tongue.<sup>6</sup>

Also, the use of medications and other therapeutic interventions due to COVID 19, has led to an increase in oropharyngeal symptoms, oral lesions, decreased saliva production as side effects, even after recovering from COVID 19.<sup>7</sup>

In this case report, we have evaluated the post COVID oral manifestations of 3 patients.



## II. CASE PRESENTATIONS

### CASE 1:

A 48-year-old male patient who works as a driver in Mumbai, visited the OPD, with a complaint of bleeding gums. He gave no medical history or family history of any systemic diseases. He was not having any deleterious habits like smoking, tobacco eating, alcohol consumption etc. His oral hygiene status was fair. He was tested positive for COVID infection on 22nd August 2020 with symptoms like high fever, cough, headache and breathlessness, for which he was admitted to

Government hospital. He was then given treatment consisting of antibiotics (Tablet Azithromycin), Tablet Paracetamol and Vitamin C supplements for a period of 7 days along with steam inhalation.

He also had few oral signs and symptoms like taste alteration, burning mouth and ulceration of oral mucosa. Taste alteration progressively increased and finally there was loss of taste. Taste perception returned to normal within 15-20 days after testing negative for COVID infection. He mentioned that there was increased gingival bleeding and mobility of teeth post COVID infection. He also experienced gingival enlargement in mandibular anterior region.



### CASE 2:

A 42-year-old female patient who works as a servant in Mumbai, presented with a complaint of unclean teeth. She gave history of hypothyroidism since 8 years, for which she was under medication and a history of diabetes mellitus since 6 months, for which no medication was taken. She did not have any deleterious habits like smoking, tobacco chewing, alcohol consumption etc. Her oral hygiene status was fair. She tested positive for COVID infection on 28 May 2020 with symptoms such as breathlessness, fatigue and loss of taste for which she was admitted to Government hospital on 31 May 2020. She was given medications including antibiotics, anti-inflammatory drugs and vitamin C supplements for a period of 7 days along with steam inhalation. She

was discharged on 9 June 2020 after testing negative for COVID, following which she was kept in isolation for a period of 7 days.

On the 2nd day after testing positive for COVID-19, she started experiencing burning sensation in her mouth. She gave history of redness and ulceration on right and left buccal mucosa for which she was prescribed glycerine for topical application. Post recovery from COVID-19, she had persistent symptoms like taste alteration and ulceration of oral mucosa which subsequently resolved within 8-10 days. She mentioned having spontaneous gingival bleeding and loss of attachment in mandibular anterior region. She also gave history of increased mobility of mandibular central incisors.



**CASE 3:**

A 49-year-old male patient who works as a watchman in Mumbai, presented with a complaint of receded gums and mobile teeth. He had no medical history or family history of any systemic diseases. He did not have any deleterious habits like smoking, tobacco chewing, alcohol consumption etc. His oral hygiene status was poor. He tested positive for COVID infection on 24 May 2020 with symptoms like high grade fever, chest pain, breathlessness and fatigue for which he was admitted to Government hospital. He was prescribed anti-inflammatory drugs, antibiotics and vitamin supplements. He was discharged on 4 June 2020 after testing negative for corona virus,

following which he was kept in isolation for a period of 7 days.

During his admission in hospital, he also complained of throat pain, halitosis, loss of taste and ulceration on buccal mucosa. After recovery from COVID-19, taste sensation was resolved within few days and ulcerations present on buccal mucosa also disappeared without any treatment. He experienced decreased salivary flow post recovery from COVID-19, due to which he complained of dry mouth and halitosis. His periodontal status worsened and there was increased gingival enlargement and gingival bleeding in mandibular anterior region. He also experienced pus discharge from maxillary left lateral incisor.





### III. DISCUSSION

The role of dentists in the present COVID 19 scenario has grown by leaps and bounds due to the potential role of oral cavity in the etiopathogenesis of the virus, which could be related to the presence of Angiotensin Converting Enzyme 2 receptors located at various areas in the oral cavity.<sup>6</sup>

The oral cavity is an 'ecological community of commensal, symbiotic and pathogenic organisms' harbouring various periodontopathic bacteria.<sup>8</sup> Various studies have tried to find the link connecting the oral cavity, periodontal status and COVID 19. In this case report we have tried to evaluate the oral and periodontal findings in patients who were diagnosed as COVID 19 positive. The patients in our study, had primary oral manifestations such as loss of taste sensation/ alterations (dysgeusia) and presence of ulcers and periodontal manifestations.

These findings are in correlation with other studies by Amorim dos Santos et al. 2020;<sup>9</sup> Cebeci Kahraman and Çaşkurlu 2020;<sup>10</sup> Martín Carreras-Presas et al. Behzad Iranmanesh,<sup>11</sup> Dominguez-Santos<sup>12</sup> which included taste disorders, non-specific oral ulcerations, fissured or de-papillated tongue, macules, papules, aphthous ulcers, plaque, pigmentation, halitosis, desquamative gingivitis, petechiae, necrotizing periodontal disease and coinfections such as candidiasis. Studies have reported the sites of occurrence of the lesions in the oral cavity as tongue (38%), labial mucosa (26%), and palate (22%).

The oral hygiene status of the patient also plays a major role in the etiopathogenesis of COVID 19<sup>[8]</sup>. Our study report shows that the patients had periodontal manifestations. The patients also complained of suppuration during the phase of COVID. Nagaoka et al,<sup>13</sup> in their study concluded that patients having higher levels of periodontopathic bacteria such as *F. nucleatum*, *P. gingivalis* and *P. intermedia*, had severe pneumonia. Also a study carried out by, Nadya Marouf<sup>14</sup> stated that Periodontitis was significantly associated with a higher risk of complications from COVID- 19.

The various oral manifestations as those in our case report, as well as other studies, could be due to the therapeutic measures and immunosuppression caused, or cytokine storm activated by the virus which causes the neutrophils to attack the oral mucosa,<sup>15</sup> leading to a susceptible oral cavity, decreased salivary flow, all causing super-infections and opportunistic fungal infections due to COVID 19.<sup>16</sup>

### IV. CONCLUSION

During the COVID 19 pandemic, it is essential for dentists to be vigilant and keep a watchful eye over the oral cavity, as it could be a potential tool for understanding the implications of the novel Corona virus. In our case study, though we have reported intra-oral findings, periodontal disease conditions, associated with COVID 19, we cannot draw a link for certain, since these findings could be chance occurrences. Yet, we cannot deny that secondary infections are caused due to long term antibiotic usage, stress, lack of oral hygiene and systemic deterioration caused by the virus.

### REFERENCES

- [1]. Wang, C., Horby, P. W., Hayden, F. G., & Gao, G. F. (2020). A novel coronavirus outbreak of global health concern. *The Lancet*, 395(10223). [https://doi.org/10.1016/S0140-6736\(20\)30185-9](https://doi.org/10.1016/S0140-6736(20)30185-9)
- [2]. World Health Organization Coronavirus disease 2019 (COVID-19) situation report – 99 [INTENET] Data as received by WHO from national authorities by 10:00 CEST, 28 April 2020 <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200428-sitrep-99-covid-19.pdf>.
- [3]. Features, Evaluation, and Treatment of Coronavirus. [Updated 2021 Mar 1] In: StatPearls [Internet] Cascella M, Rajnik M, Cuomo A, et al.. Treasure Island (FL): StatPearls Publishing; 2020 Jan Available from: <https://www.ncbi.nlm.nih.gov/books/NBK554776/>
- [4]. Xu, R., Cui, B., Duan, X. et al. Saliva: potential diagnostic value and transmission of 2019-nCoV. *Int J Oral Sci*, 2020; 12;11.
- [5]. Herrera D, Serrano J, Roldán S, Sanz M. Is the oral cavity relevant in SARS-CoV-2 pandemic?. *Clin Oral Investig*. 2020;24(8):2925-2930. doi:10.1007/s00784-020-03413-2
- [6]. Xu, X.; Chen, P.; Wang, J.; Feng, J.; Zhou, H.; Li, X.; Zhong, W.; Hao, P. Evolution of the novel coronavirus from the ongoing Wuhan outbreak and modeling of its spike protein for risk of human transmission. *Sci. China Life Sci*. 2020;63; 457–460.
- [7]. Corchuelo J, Ulloa FC. Oral manifestations in a patient with a history of asymptomatic COVID-19: Case report. *Int J Infect Dis*. 2020 Nov;100:154-157. doi: 10.1016/j.ijid.2020.08.071. Epub 2020 Sep



1. PMID: 32882435; PMCID: PMC7462545.
- [8]. Sampson, V., Kamona, N., & Sampson, A. Could there be a link between oral hygiene and the severity of SARS-CoV-2 infections? *British Dental Journal*, 2020; 228(12); 971–975. doi:10.1038/s41415-020-1747-8
- [9]. J. Amorim dos Santos Oral Manifestations in Patients with COVID-19: A Living Systematic Review *International association of dental research*, 2021;100 ( 2);141-154.
- [10]. CebeciKahraman F, Çaşkurlu H. Mucosal involvement in a COVID-19-positive patient: A case report. *Dermatol Ther*. 2020 Jul;33(4):e13797. doi: 10.1111/dth.13797. Epub 2020 Jul 3. PMID: 32520428; PMCID: PMC7300528.
- [11]. Iranmanesh B, Khalili M, Amiri R, Zartab H, Aflatoonian M. Oral manifestations of COVID-19 disease: A review article. *Dermatol Ther*. 2021;34(1):e14578. doi:10.1111/dth.14578
- [12]. MULLOL J, ALOBID I, MARIÑO-SÁNCHEZ F, et al. The Loss of Smell and Taste in the COVID-19 Outbreak: a Tale of Many Countries. *Curr Allergy Asthma Rep* 20, 61 (2020). <https://doi.org/10.1007/s11882-020-00961->
- [13]. Nagaoka K, Yanagihara K, Morinaga Y et al. Prevalence of Severe BacteraemicPneumococcalPneumonia in Mice with Upregulated PlateletActivating Factor Receptor Expression. *Infect Immun* 2014; 82: 587–593.
- [14]. Marouf N, Cai W, Said KN, Daas H, Diab H, Chinta VR, Hssain AA, Nicolau B, Sanz M, Tamimi F. Association between periodontitis and severity of COVID-19 infection: A case-control study. *J Clin Periodontol*. 2021 Feb 1. doi: 10.1111/jcpe.13435. Epub ahead of print. PMID: 33527378.
- [15]. Mehta P, McAuley DF, Brown M, et al. COVID-19: consider cytokine storm syndromes and immunosuppression. *Lancet*. 2020;395(10229):1033-1034. doi:10.1016/S0140-6736(20)30628-
- [16]. Dziejczak A, Wojtyczka R. The impact of coronavirus infectious disease 19 (COVID-19) on oral health. *Oral Dis*. 2021;27 Suppl 3:703-706. doi:10.1111/odi.