

Oxygen therapy for treatment of oral lesions following COVID-19 infection: a case report

Oxigenoterapia para tratamento de lesões orais após infecção por COVID-19: relato de caso

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ABSTRACT

Oral manifestations following COVID-19 infection can cause discomfort to patients, therefore new treatments must be investigated in order to avoid or minimize this condition. The aim of this study was to report on the use of oxygen therapy in the treatment of COVID-19 oral manifestations. A 22-year-old male patient sought dental care 15 days after isolation due to the infection. He noticed that lesions had arisen in his oral cavity, having initially decreased, but returned after quarantine. The patient had difficulty in eating due to painful symptoms and a burning sensation in the tongue. During clinical examination several lesions were found in his mouth. Treatment using oxygen therapy was proposed with the mouthwash containing active oxygen. After the first day of treatment the patient reported that he was able to eat more easily; after the second day he was able to eat normally, and the burning sensation in his tongue also stopped; by the tenth day total lesions regression had occurred. It was found that the use of oxygen therapy promotes healing of oral lesions due to COVID-19, bringing comfort to the patient, reducing painful symptoms and leading to total healing of lesions.

Keywords: Coronavirus infections; Oral diagnosis; Oral manifestations; Oral medicine; Dentistry.

RESUMO

As manifestações bucais após a infecção por COVID-19 podem causar desconforto ao paciente, portanto novos tratamentos devem ser investigados a fim de evitar ou minimizar essa condição. O objetivo deste estudo foi relatar o uso da oxigenoterapia no tratamento das manifestações orais da COVID-19. Paciente do sexo masculino, 22 anos, procurou atendimento odontológico 15 dias após isolamento decorrente da infecção. Ele notou que surgiram lesões em sua cavidade bucal, tendo inicialmente diminuído, mas que retornaram após a quarentena. O paciente apresentava dificuldade para se alimentar devido a sintomas dolorosos e sensação de queimação na língua. Durante o exame clínico foram encontradas várias lesões na boca. O tratamento com oxigenoterapia foi proposto com enxaguatório bucal contendo oxigênio ativo. Após o primeiro dia de tratamento, o paciente relatou que conseguia se alimentar com mais facilidade; a partir do segundo dia já conseguia comer normalmente, e a sensação de queimação na língua também cessou; no décimo dia ocorreu a regressão total das lesões. Constatou-se que o uso da oxigenoterapia promoveu a cicatrização das lesões bucais decorrentes da COVID-19, trazendo conforto ao paciente, reduzindo os sintomas dolorosos e levando à cicatrização total das lesões.

Palavras-chave: Infecções por coronavírus; Diagnóstico oral; Manifestações orais; Medicina oral; Odontologia.

INTRODUCTION

COVID-19 (SARS-CoV-2) started in Wuhan (China), spreading rapidly through several countries, and on March 11, 2020 was classified as a pandemic by the World Health Organization (Cucinotta and Vanelli, 2020). In most patients, COVID-19 results in mild symptoms, but in some these symptoms are more complex and can even lead to death (Gautret et al., 2020; Habibzadeh and Stoneman, 2020; Lai et al., 2020; Zhu et al., 2020). The mortality rate ranges from 2.3% in young patients, rising to 8% in those aged 70 to 79 years, and reaching around 14.8% in patients over 80 years old (Gautret et al., 2020; Lai et al., 2020; Zhu et al., 2020).

The main transmission route of the disease is through oral cavity droplets (Hassan and Amer, 2021), and the lungs are the dominant organ affected by the disease, leading to respiratory distress through to fatal complications (Guan et al., 2020); however other organs may also be affected (Huang et al., 2020). The literature reports oral manifestations with multiple aspects that arise as a result of COVID-19 infection (Al-Khatib, 2021; Amorim et al., 2020; Ansari et al., 2021; Martín et al., 2021; Stroparo et al., 2021a), which are symptomatic in 68% of cases (Iranmanesh et al., 2021). This motivates and justifies investigation of new forms of treatment in order to avoid or minimize discomfort caused by these lesions.

In this context, it is known that use of oxygen therapy promotes better tissue healing, as it stimulates angiogenesis, promotes revascularization and has an antimicrobial effect, making healing faster and reducing discomfort felt by patients when used in the postoperative period (Eisenbud, 2012; Stroparo et al., 2021b, 2021c). These are aspects than can be considered potentially relevant for the treatment of lesions resulting from COVID-19.

The aim of this study is therefore to report on the use of oxygen therapy in the treatment of oral manifestations following COVID-19 infection.

CASE REPORT

First visit and clinical examination

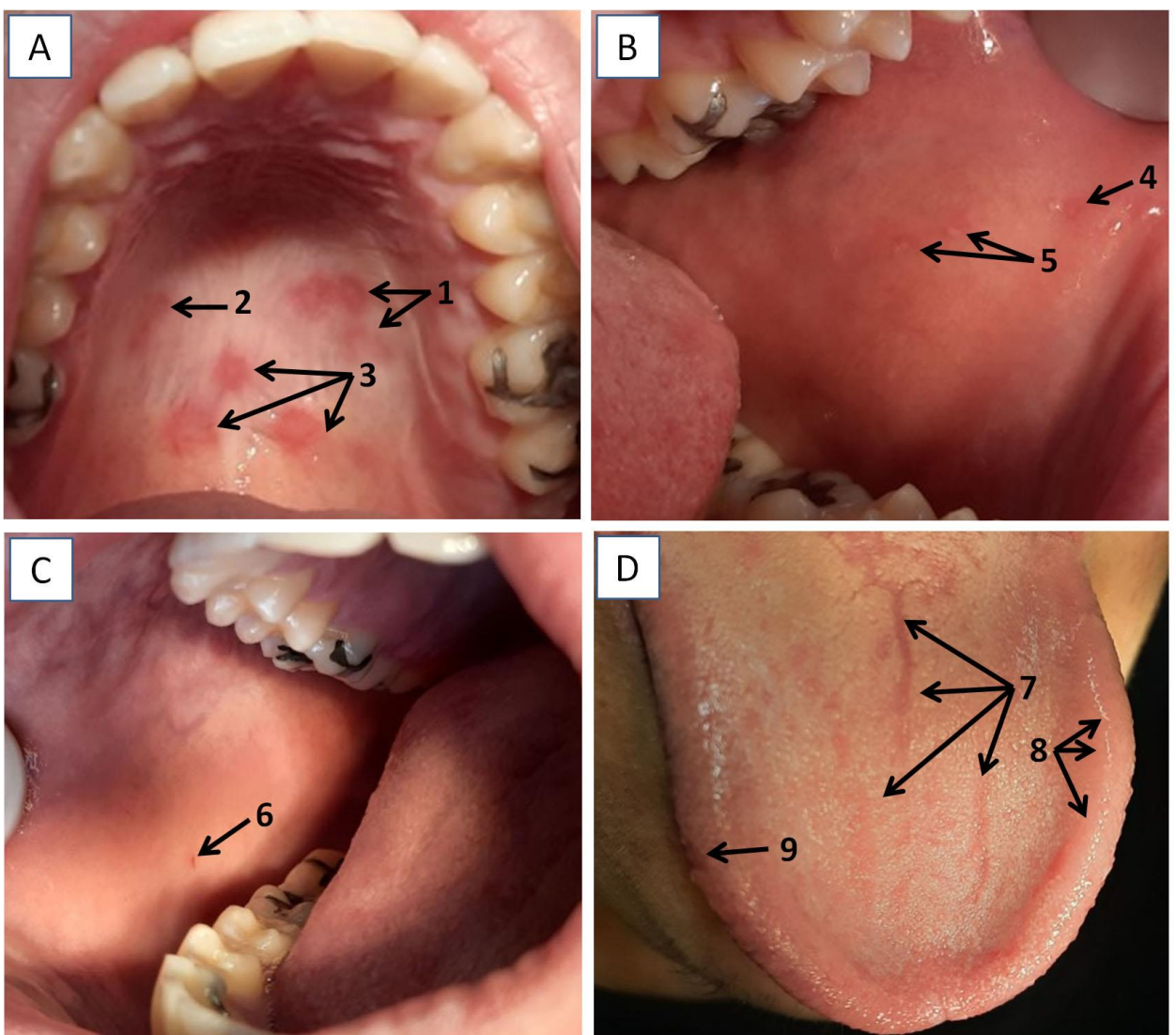
In May 2021, a 22-year-old male patient sought our private dental clinic 15 days after the end of the isolation period due to COVID-19. He reported having needed hospital care due to the infection.

The patient noticed that lesions had appeared in his oral cavity ten days after the virus was detected. The lesions decreased for a short time, but returned at the end of the quarantine period. He sought dental care due to difficulty in eating, reporting painful symptoms and a burning sensation in his tongue.

During clinical examination, multiple erythematous lesions were noted on his palate, each one being about 3 to 4 mm in diameter (Fig. 1A). Vesicular-papular lesions were noted in the left jugal mucosa (Fig. 1B), and erythete lesions in the right jugal mucosa (Fig. 1C). Also, plaque lesions appeared on the tongue, with fissures in the median groove and next to it. The left lateral edge was depapilated and there was ulceration in the right anterior third. The patient complained of a burning sensation in his tongue (Fig. 1D).

Written informed consent was obtained from the patient for this case report to be publicized.

Figura 1 - Aspects of the oral lesions detected during the clinical examination. A) Arrows 1, 2 and 3, multiple erythematous lesions in defined limits of the hard palate, circumscribed and flat, measuring about 3 to 4 mm in diameter, present for two weeks, symptomatic, without ulceration, smooth surface, and soft consistency; B) Arrows 4 and 5, vesiculopapular lesions in jugal mucosa, with defined limits, measuring about 1 mm, whitish coloration, sessile, and with evolution time of two weeks; C) Arrow 6, erythematous lesions present in right jugal mucosa, isolated with flat surface in relation to epithelial tissue, and compatible with ecchymosis; D) Arrow 7, lesions in tongue, fissures in the median groove, also present to the right and left of it; Arrow 8, left lateral edge depapilated; Arrow 9, right lateral edge ulcerated in the anterior third.

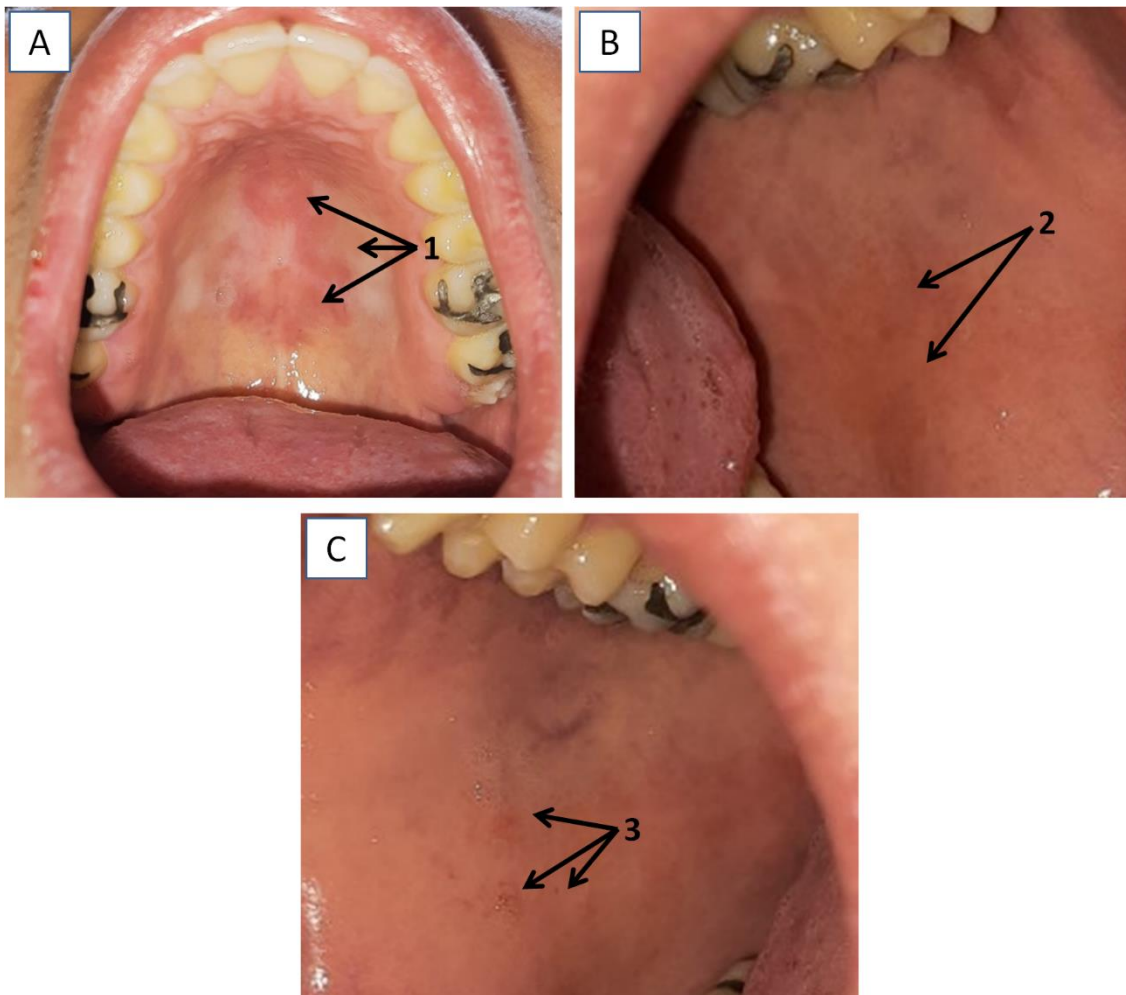


Source: Authors (2023).

As several lesions were observed in the oral cavity, to the patient was offered treatment with oxygen therapy by using Blue[®]M active oxygen-based mouthwash (Blue[®]M, 5 Pillars Research B.V., Holland, Netherlands). The patient was instructed to perform 30-second mouthwashes with the solution twice a day for ten days.

The patient reported that after the first day of treatment he was able to eat more easily, and after the second day he was able to eat normally and the burning sensation in his tongue also stopped. On the sixth day of follow-up, we noted that the lesions on the palate were healing, presenting reddish color, without painful symptoms (Fig. 2A); left and right jugal mucosa without ulceration and not elevated, also without symptoms (Fig. 2B, 2C).

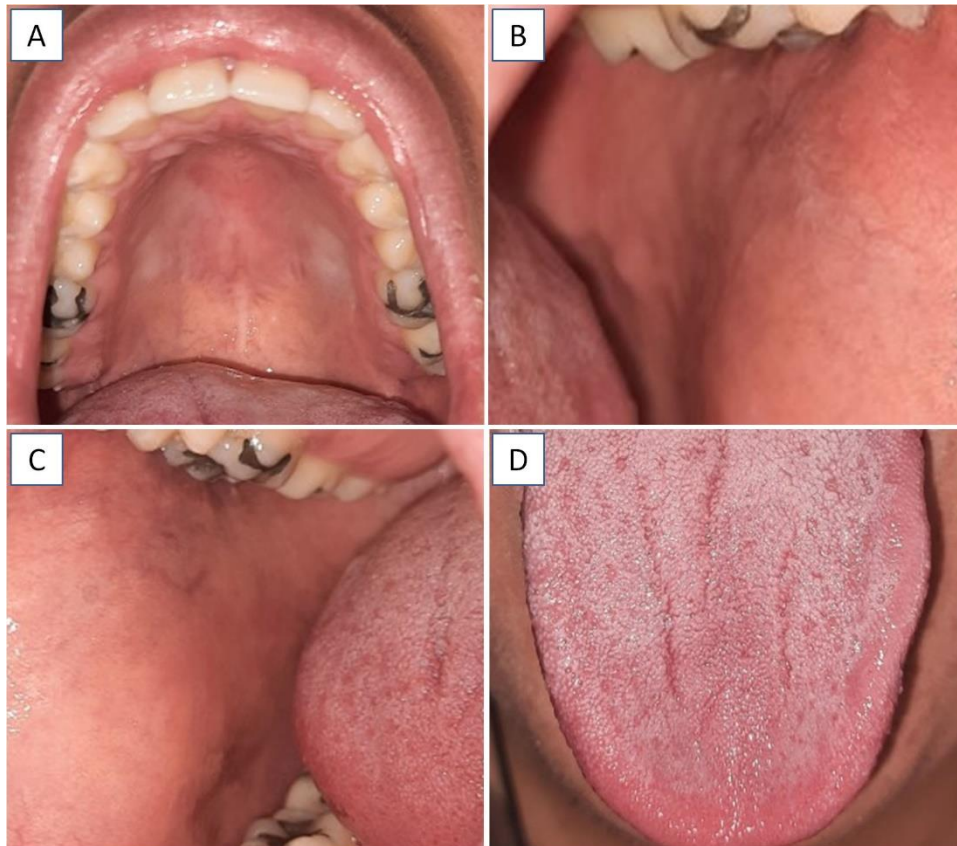
Figura 2 - Aspects of the oral lesions during the treatment. A) Arrow 1, on the palate, erythema bheresel vesicle lesions along the middle line of the hard palate, without painful symptomatology; B) Arrow 2, in the left jugal mucosa, showing punctiform lesions suggestive of petechiae, reddish color, without ulceration and not elevated, without symptomatology; C) In the right jugal mucosa punctiform lesions suggestive of petechiae, reddish color, without ulceration and not elevated, without symptomatology.



Source: Authors (2023).

On the tenth day of follow-up, total lesion regression and normal anatomical aspects were found (Fig. 3A, 3B, 3C, 3D).

Figura 3 - Final aspect of the oral lesions at the end of treatment. A,B,C,D) Total regression of lesions and normal anatomical aspects with the use of oxygen therapy.



Source: Authors (2023).

DISCUSSION

The pandemic caused by SARS-CoV-2, the virus that causes COVID-19, has affected populations in different ways and caused the scientific community to face a new disease with very complex manifestations, with a clinical course difficult to control and having a strong impact on mortality rates (Cucinotta and Vanelli, 2020).

The most common symptoms of COVID-19 are headache, fever, sore throat, dry cough, dyspnea, vomiting, abdominal pain, diarrhea, and respiratory distress (Guan et al., 2019; Huang et al., 2020; Iranmanesh et al., 2021). The literature reveals that COVID-19 may cause damage not only to the lung, but to the heart, kidneys, liver, blood and the immune system (Huang et al., 2020). Also, oral manifestations can occur (Ansari et al., 2021; Iranmanesh et al., 2021), with high levels of problematic symptomatology (Iranmanesh et al., 2021). According to Petrescu et al. (2020), the oral mucosa is the main area infected by SARS-CoV-2.

There is no consensus in the literature regarding the hypotheses of the onset of oral lesions caused by SARS-CoV-2 infection. Given the time (after ten days of infection) in which the lesions

manifested themselves in the case presented here, we suggest that they may be related to signs of the disease. The patient had no comorbidity, but COVID-19 infection led to him having symptoms so serious that he required hospital care and during this period he noticed the appearance of oral manifestations of the disease that hindered his food intake. Some authors have reported that these lesions often remain after the disappearance of the disease even in healthy patients (Petrescu et al., 2020)

Other hypotheses of the origin of these lesions suggest that they may be the result of strong direct viral infection or decrease in the patient's immune response capacity so as to be vulnerable to opportunistic infections (Amorim et al., 2020; Brandão et al., 2021). In the view of Amorim dos Santos et al. (2021), oral manifestations are secondary to the deterioration of systemic health or due to treatment for COVID-19.

According to Iranmanesh et al. (2021), the most common affected oral areas were the tongue (38%), followed by the labial mucosa (26%) and the palate (22%). The manifestations described are vesicle, ulcer, pustule, fissured or depapilated tongue, plaque, macula, petechiae, whitish areas, hemorrhagic crust, erythema, spontaneous bleeding, and necrosis (Brandão et al., 2021; Iranmanesh et al., 2021; Stroparo et al., 2021a). Predominantly, COVID-19 is associated with oral vesiculobullous lesions (Martín et al., 2021) as reported in the present case.

Among all the lesions described in the literature (Ansari et al., 2021), many of them were found in this case report, which caused serious discomfort to the patient. The authors in the literature also reported that the latency period of these lesions ranged from four days to 12 weeks after the onset of systemic symptoms (Brandão et al., 2021; Iranmanesh et al., 2021; Stroparo et al., 2021a), as also shown in this study, given that the lesions had not disappeared 15 days after the end of the patient's isolation period, and given that he had many painful symptoms.

Regarding the treatment proposed here, presence of active oxygen in wound healing is essential because it promotes increased cellular metabolism, increased collagen synthesis, increased antibacterial activity, promotes and facilitates the release of growth factors, increases angiogenesis and promotes tissue revascularization (Eisenbud, 2012; Stroparo et al., 2021b; 2021c) showing better case prognosis, as demonstrated in the rapid healing and disappearance of the painful symptomatology of the lesions in this report.

Despite the positive effects of the therapy used in the treatment of the case presented, further studies should be conducted in order to observe use of oxygen therapy for the treatment of oral manifestations caused by COVID-19.

CONCLUSION

Oxygen therapy can be useful in healing oral lesions due to COVID-19, bringing comfort to the patient, reducing painful symptoms and leading to total healing of lesions.

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