

**SHORT COMMUNICATION**

# Two cases of COVID-19 with positive salivary and negative pharyngeal or respiratory swabs at hospital discharge: A rising concern

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**Abstract**

We report two cases of COVID-19 showing negative respiratory swabs but positive salivary samples at the same time. These findings rise the concern about how to manage these patients before hospital discharging, thus avoiding contagion among their family members or a second coronavirus wave once the lockdown is over.

**KEYWORDS**

Coronavirus, COVID-19, nCoV-2019, saliva, SARS-CoV-2

**1 | INTRODUCTION**

Several studies have demonstrated the presence of SARS-CoV-2 in the sputum or oropharyngeal secretions, that is, “posterior oropharyngeal saliva” (Braz-Silva, Pallos, Giannecchini, & To, 2020; To, Tsang, Leung, et al., 2020; To, Tsang, Yip, et al., 2020).

On March 30, colleagues from Beijing reported that they retrospectively found 22 patients in a population of 153 subjects (i.e.,

14.38%) with positive sputum or fecal samples paired with a follow-up negative pharyngeal swab (Chen et al., 2020).

A recent paper published by our group reported that oral saliva could represent a valid instrument in COVID-19 diagnosis (Azzi et al., 2020).

The aim of this short communication was to report two cases of COVID-19 showing negative pharyngeal or bronchoalveolar swabs but positive salivary samples at the same time.

## 2 | CASE REPORTS

A 71-year-old man with a history of dyslipidemia, mild obesity, OSAS, and turbinate hypertrophy presented at our hospital with fever, dyspnea, and cough on March 9. His nasopharyngeal swab was positive on admission. The course of the disease was severe, but the patient did not require intensive care or endotracheal intubation. After 10 days, a salivary sample was collected through the drooling technique. This technique allows to collect only oral fluids, thus excluding mucous secretions from oropharynx or lower respiratory tract. A RT-qPCR analysis was performed. The specimen was resuspended in 2 ml of PBS; 140 µl were subjected to RNA extraction by QIAamp Viral RNA Mini Kit (Qiagen) and eluted in 60 µl. One-step rRT-PCR was performed using Luna Universal qPCR Master Mix (New England Biolabs) from 5 µl of extracted RNA. Forward (5'-ACCTTCCCAGGTAACAAACCA-3') and reverse (5'-TTACCTTTCGGTCACACCCG-3') primers targeting the 5'UTR region of SARS-CoV-2 were used. All samples were run in four replicates and compared with a previously known positive control with ABI PRISM 7000 Sequence Detection System (Applied Biosystems).

The result of the RT-qPCR was positive.

However, on the same day, a nasopharyngeal swab provided a negative result, as well as a second one repeated after 2 days (Figure 1).

A 64-year-old man, with a history of hypertension, was admitted on February 27 to the local hospital in his town with severe symptoms of dyspnea, cough, and fever. The patient lives in a town in the coronavirus epicentral zone (the "red zone"), where the epidemic episode in northern Italy began at the end of February 2020. The

patient's medical condition rapidly deteriorated, and he underwent endotracheal intubation with mechanical ventilation. He was transferred to our hospital on March 9. During the following weeks, his conditions progressively improved, until he was eventually extubated on March 30.

A salivary sample was collected with the use of a pipette on March 23, 26 days after the initial diagnosis of COVID-19, and also in this instance, saliva was positive.

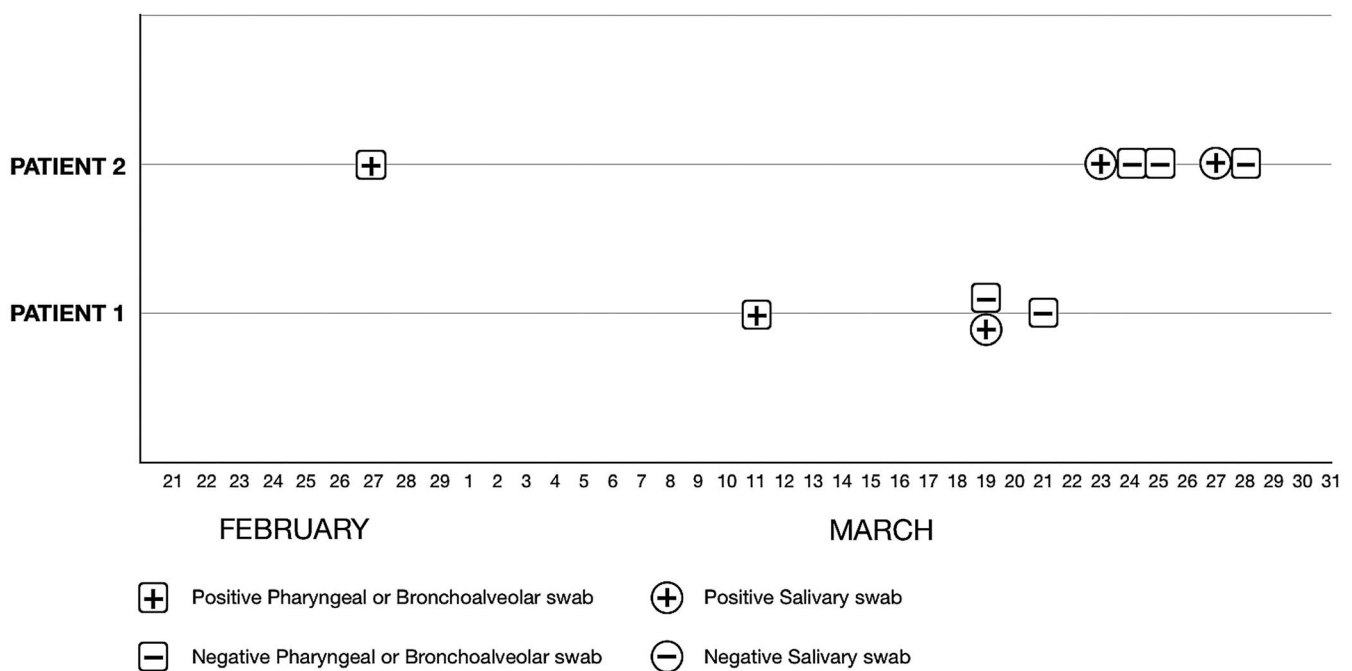
During the two following days, two bronchoalveolar swabs were found to be negative for SARS-CoV-2, but on March 27, a second salivary sample confirmed the presence of the virus in the mouth.

## 3 | DISCUSSION

RT-qPCR analysis on pharyngeal or respiratory tract swabs is considered the gold standard for the detection of SARS-CoV-2 infection. Nevertheless, several reports showed the existence of false-negative results or the persistence of the virus in the body after the pharyngeal swab conversion (Li et al., 2020).

The role of salivary and oral fluids in the detection of SARS-CoV-2 is an issue that has been recently raised (Khurshid, Asiri, & Al Wadaani, 2020).

During our research, we found two patients out of 25 subjects (i.e., 8%) affected by COVID-19 with different degrees of severity, who showed positive salivary results on the same days when their pharyngeal or bronchoalveolar swabs proved to be negative (Azzi et al., 2020). These findings, together with those reported by the



**FIGURE 1** The temporal line of the clinical course in the two patients shows how their salivary samples tested positive, while the pharyngeal or bronchoalveolar swabs were negative on the same day (Patient 1 on March 19) or during the interval between two consecutive salivary swabs (Patient 2, March 23–28)

Chinese colleagues on sputum, rise the concern about how to manage these patients before hospital discharging.

As an example, in our department we will carry out a salivary analysis after that two consecutive pharyngeal swabs prove negative and wait until the same results are registered also in saliva.

However, if patients are discharged without a salivary control, it should be advisable that they resort to social isolation for at least 14 days, avoiding contagion among their family members or a second coronavirus wave once the lockdown in Italy is over.

#### CONFLICT OF INTERESTS

None.

#### AUTHOR CONTRIBUTION

**Lorenzo Azzi:** Conceptualization, Project administration. **Giulio Carcano:** Investigation. **Daniella Dalla Gasperina:** Data curation. **Fausto Sessa:** Methodology. **Vittorio Maurino:** Software; Visualization. **Andreina Baj:** Formal analysis.

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