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OPERATIVE TECHNIQUES

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COVID-19: Nasal and oropharyngeal swab

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Abstract

Performing a proper nasal and oropharyngeal swab procedure is essential in the screening of COVID-19 infection. The video illustration of nasal and oropharyngeal swab is presented (Video S1). To correctly perform the nasopharyngeal swab, the patient must be seated comfortably with the back of their head against the headrest. The swab is inserted in the nose horizontally, along an imaginary line between the nostril and the ear. Oropharyngeal sampling is easier to perform. The swab is directed toward the rear wall of the oropharynx and it is rotated a few times before removal. After taking the sample, it is necessary to insert both swabs in the same tube, breaking the rod with one swift and controlled movement. Finally, carefully reset the cap. It appears to be extremely important to properly collect nasopharyngeal and oropharyngeal swabs in order to minimize the false negative rate among COVID-19 positive patients.

KEYWORDS

coronavirus, COVID-19, nasopharynx, oropharynx, swab

1 | INTRODUCTION

The World Health Organization has recently established a nasal and oropharyngeal swab that tests for viral RNA. However, this represents more a screening test rather than a pure diagnostic test. In fact, around 30% of swabs from clinically symptomatic patients give a false negative.[1] We must therefore assume that if we were to test a population that is completely asymptomatic by swabbing, then the false negative rate should be proportionally increased. We should also take into account the kinetics of viral RNA. In the early stages of the infection, where the viral load is low, it would be more difficult to take a sample with enough viral RNA to test positive.[2]

2 | NASOPHARYNGEAL AND OROPHARYNGEAL SWAB PROCEDURE

To correctly perform the nasopharyngeal swab, the patient must be seated comfortably with the back of their head against the headrest. Furthermore, it can helpful to lift the tip of the patient's nose. From the side view of the patient, the swab is inserted in the nose horizontally, along an imaginary line between the nostril and the ear. Upon reaching the posterior wall of the nasopharynx, rotate the tip of the swab continuously for a few seconds, before gently removing the swab. Be careful not to insert the swab in an upwards direction or limit the sampling to only the anterior portion of the nasal cavity as this would reduce the probability of taking a significant amount of viral RNA. Oropharyngeal sampling is easier to

perform. The swab is directed toward the rear wall of the oropharynx and it is rotated a few times before removal.

After taking the sample, it is necessary to insert both swabs in the same tube, breaking the rod with one swift and controlled movement. Finally, carefully reset the cap.

3 | DISCUSSION

The COVID-19 infection can be diagnosed from upper and lower respiratory sources including the oropharynx, nasopharynx, sputum, and bronchial fluid.[3,4] Upper respiratory specimens such as oropharynx and nasopharynx swabs are easier to collect especially in limited resource settings. They should be collected within the first few days from the onset of symptoms since RNA positive rates peak in upper respiratory tract specimens at 7 to 10 days after symptom onset and then they steadily decline.[1] It appears to be extremely important to properly collect nasopharyngeal swabs reaching the posterior rhinopharyngeal tonsil region.

CONFLICT OF INTEREST

The authors declare no potential conflict of interests.

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REFERENCES

1. Loeffelholz MJ, Tang YW. Laboratory diagnosis of emerging human coronavirus infections—the state of the art. *Emerg Microbes Infect*. 2020;9:747-756. https://doi.org/10.1080/22221751.2020.1745095.
2. Chen Y, Chen L, Deng Q, et al. The presence of SARS-CoV-2 RNA in feces of COVID-19 patients. *J Med Virol*. 2020. https://doi.org/10.1002/jmv.25825.
3. Gaunt ER, Hardie A, Claas EC, et al. Epidemiology and clinical presentations of the four human coronaviruses 229E, HKU1, NL63, and OC43 detected over 3 years using a novel multiplex real-time PCR method. *J Clin Microbiol*. 2010;48(8):2940-2947. https://doi.org/10.1128/JCM.00636–00610.
4. Charlton CL, Babady E, Ginocchio CC, et al. Practical guidance for clinical microbiology laboratories: viruses causing acute respiratory tract infections. *Clin Microbiol Rev*. 2019;32(1):e00042-18. https://doi.org/10.1128/CMR.00042-18.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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