SARS-CoV-2 in endoscopy: a potential way of microorganisms' air transmission

We read with great interest the recently published study of Boškoski *et al*[1] concerning the virus transmission through the endoscopes in patients with SARS-CoV-2. The authors found that the samples taken with swabs on the endoscopes immediately after the endoscopic procedure (digestive and pulmonary) were negative for COVID-19. These data are important and show that the risk of patient-to-patient contamination during endoscopy seems very low.

However, two things must be taken into account. The first one is the delay between the onset of symptoms or the first positive PCR for SARS-CoV-2 and the timing of the samples' swabs since it has been proven that the viral load of SARS-CoV-2 decreases over time. It would have been interesting to know whether SARS-CoV-2 was positive in the oropharynx of the patients at the time the endoscopy was performed.

Second, this study did not eliminate the fact that endoscopy is safe in patients with SARS-CoV-2, since the contamination could also be the consequence of airborne transmission. It has been recently shown that there is an aerosolisation of virus during oesophagogastroduodenoscopy.[2] The virus has been identified in the area around the patient close to the endoscope processor and the light source. Chaussade *et al*[3] have recently shown that there was a potential risk of transmission of microparticles and virus through the air by the fan system and the air pump of the endoscopes used in digestive

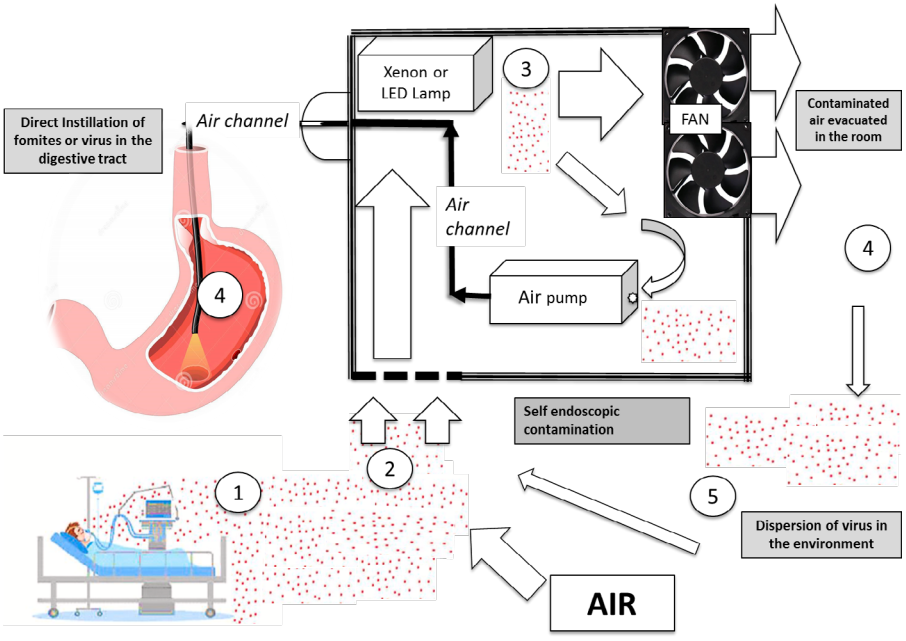

Figure 1 Microorganisms' circulation in the light source and the environment. 1+2—Environmental air aspirated through the endoscope. 3—Air circulation through the light source. 4—Contaminated air evacuated into the room and direct instillation of viruses/fomites in the digestive tract. 5—Dispersion of the viruses/fomites in the environment. LED, light-emitting diode.

endoscopy. The light source contains a lamp which induces high temperature in the box. This high temperature is controlled by a forced-air cooling system to maintain a stable temperature in the middle of the box (25°C). The air used by the forced-air cooling system is sucked from the closed environment of the patient through one or several aeration ports, located close to the light source and evacuated out of the box by several fans (figure 1). The volume of air that goes through the light source box may be very high (4–5 m^3/min, ie, 240–300 m^3 for a 1-hour examination). This system can facilitate the diffusion of viruses or fomites outside the light system and the processor. On the other hand, the air pump is located inside the light box. The air is sucked from the light source box through the air pump and pushed from the air pump into the air pipe and then to the distal tip of the endoscope. The air pump does not have a dedicated high-efficiency particulate air filter (HEPA) filter to avoid transmission of microorganisms such as bacteria and viruses and is not accessible for microbiological control. A potential contamination of the light source and of the air pump is possible and could be associated with a potential risk of patient-to-patient transmission of viruses, bacteria or fungi.

Despite the absence of publications on endoscopic-transmitted cases of SARS-CoV-2 in the literature, the study of Boškoski *et al* cannot formally exclude this means of transmission.

Stanislas Chaussade,[1] **Rachel Hallit**,[1] **Einas Abou Ali,**[1] **Arthur Belle,**[1] **Maximilien Barret**,[1] **Romain Coriat**[1]

Gastroenterology and Digestive Oncology Department - Université de Paris-GH APHP Centre, Hospital Cochin, Paris, Île-de-France, France

Correspondence to Professor Stanislas Chaussade, Gastroenterology and Digestive Oncology Department-Université de Paris-GH APHP Centre, Hospital Cochin, Paris 75014, Île-de-France, France; stanislas.chaussade@gmail.com

Contributors SC: Study conceptualisation, writing and review of the original article. RH: Writing and review of the original draft and editing. RC: Supervision of the study, review of the original draft and editing. MB: Supervision of the study. AB, EAA: Review of the manuscript. All authors provided the final approval of the article before submission.

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ORCID iDs
Rachel Hallit http://orcid.org/0000-0001-8866-6234
Maximilien Barret http://orcid.org/0000-0002-0566-7870

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