

Coronavirus disease outbreak: a simple infection prevention measure using a surgical mask during endoscopy

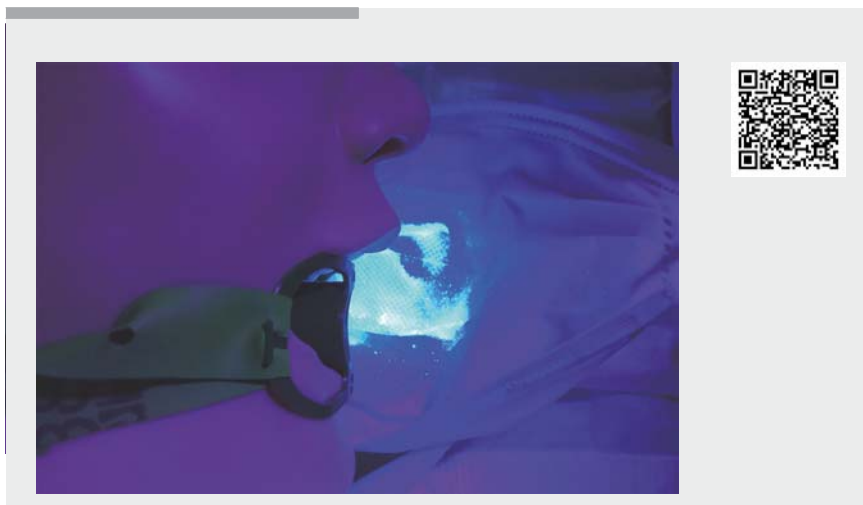


► **Fig. 1** The modified surgical mask.

Coronavirus disease (COVID-19) transmission occurs primarily through direct contact or air droplets [1,2], and endoscopic procedures are high risk. In this era of “with COVID-19,” establishing simple infection prevention measures within an endoscopy department to protect both patients and personnel is strongly recommended. Hence, we proposed a simple method using a modified surgical mask. We made a hole (10 mm diameter) in the center of a surgical mask (► **Fig. 1**). Next, simulated endoscopy was performed with and without the modified surgical mask using a mannequin with the mouthpiece in place (► **Video 1**).

Cough was simulated using a 0.4-MPa pressure accumulation sprayer containing 10 mL of fluorescent dye [3–5]. An endoscopist (height 173 cm) wearing standard personal protective equipment (PPE) performed upper gastrointestinal endoscopy. A nurse (height 163 cm) wearing standard PPE stood on the other side of the “patient.” The scattered dye droplets produced by the simulated cough were visualized using ultraviolet light.

Without the modified surgical mask, contamination of the floor occurred within approximately 1.5 m from the bed, and



► **Video 1** A simple infection prevention measure using a modified surgical mask during endoscopy.



► **Fig. 2** Contamination of the endoscopist by scattered dye droplets, visualized using ultraviolet light, when the modified surgical mask was not used. **a** Contamination of the endoscopist's gloves, right arm, upper chest, and abdomen. **b** The shoe covers.

the dye was clearly identified on the gloves, right arm, upper chest, abdomen, and shoe covers of the endoscopist (► **Fig. 2**). There was no dye on the endos-

copist's eye shield, mask, or cap. The dye was identified on the gloves of the nurse (► **Fig. 3**). When the modified surgical mask was worn by the “patient,” exces-



► **Fig. 3** The dye was identified on the gloves of the nurse when the modified surgical mask was not used.



► **Fig. 5** Minimal contamination of the endoscopist by scattered dye droplets, visualized using ultraviolet light, when the modified surgical mask was used.



► **Fig. 4** Excessive amounts of dye were found inside the modified surgical mask when worn by the “patient.”

sive amounts of dye were found inside the mask (► **Fig. 4**). There was no contamination of the floor, and only a minimum amount of dye was found on the endoscopist's upper chest and abdomen (► **Fig. 5**). No dye was found on the nurse. In summary, upper gastrointestinal endoscopy could be performed on a “patient” wearing a modified surgical mask. This method can substantially reduce contamination by splash and aerosol droplets produced by patients during endoscopy, and is simple and cost-effective.

Endoscopy_UCTN_Code_TTT_1AU_2AC

Competing interests

The authors declare that they have no conflict of interest.

The authors

Hirotsugu Maruyama, Akira Higashimori, Kei Yamamoto, Akinobu Nakata, Yuki Ishikawa-Kakiya, Masafumi Yamamura, Yasuhiro Fujiwara

Department of Gastroenterology, Osaka City University Graduate School of Medicine, Osaka, Japan

Corresponding author

Hirotsugu Maruyama, MD, PhD

Department of Gastroenterology, Osaka City University Graduate School of Medicine, 1-4-3, Asahimachi, Abeno-ku, Osaka 545-8585, Japan
Fax: +81-66-6453813
hiromaruyama99@gmail.com

References

- [1] Tang JW, Li Y, Eames I et al. Factors involved in the aerosol transmission of infection and control of ventilation in healthcare premises. *J Hosp Infect* 2006; 64: 100–114
- [2] Huang C, Wang Y, Li X et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020; 395: 497–506
- [3] Gupta JK, Lin CH, Chen Q. Flow dynamics and characterization of a cough. *Indoor Air* 2009; 19: 517–525
- [4] Ogata M, Ichikawa M, Tsutsumi H et al. Measurement of cough droplet deposition using the cough machine. *J Environ Eng* 2018; 83: 57–64
- [5] Sagami R, Nishikiori H, Sato T et al. Endoscopic shield: barrier enclosure during the endoscopy to prevent aerosol droplets during the COVID-19 pandemic. *VideoGIE* 2020. doi:10.1016/j.vgie.2020.05.002

Bibliography

Endoscopy 2020; 52: E461–E462

DOI 10.1055/a-1220-6024

ISSN 0013-726X

published online 20.8.2020

© 2020, Thieme. All rights reserved.

Georg Thieme Verlag KG, Rüdigerstraße 14, 70469 Stuttgart, Germany

ENDOSCOPY E-VIDEOS

<https://eref.thieme.de/e-videos>



Endoscopy E-Videos is a free access online section, reporting on interesting cases and new

techniques in gastroenterological endoscopy. All papers include a high quality video and all contributions are freely accessible online.

This section has its own submission website at

<https://mc.manuscriptcentral.com/e-videos>