

Novel mouth guard for safe endoscopy in the COVID era



► **Fig. 1** Attach the upper part of a baby's feeding bottle to the mouth guard.



► **Fig. 2** A silicon nipple with a slit functions as a valve.



► **Fig. 3** Invert the nipple into the bottle neck and screw down the collar.



► **Video 1** Novel mouth guard for safe endoscopy.

COVID-19 is a disease caused by a novel coronavirus (SARS-CoV-2), which is chiefly transmitted through respiratory secretions, aerosols, and contaminated surfaces [1].

Endoscopy is an aerosol-generating procedure and thus carries a significant risk of transmission of aerosol-borne diseases to the endoscopist and staff [2]. During endoscopic procedures, a wide open space is left between the mouth guard and the endoscope, through which large quantities of aerosols escape, increasing the risk of infection.

We have made a few changes in the mouth guard to prevent exposure to aerosols and allow endoscopy to be carried out safely. The elements of the novel mouth guard are: a standard mouth guard, a baby feeding bottle, a feeding bottle nipple, and a triple-layer mask (► **Video 1**).

Take a plastic feeding bottle and cut off the upper end at the neck. Fix this upper end of the bottle to the mouth guard (► **Fig. 1**). Then take the nipple and make a small slit across its top (► **Fig. 2**). Invert the nipple (► **Fig. 3**), place it in the bottle neck, and screw down the collar tightly



► **Fig. 4** Perspective view of the novel mouth guard.

(► **Fig. 4**). Then take a surgical mask, cut a hole in the middle of it, and fix the assembly into the mask (► **Fig. 5**). Place the novel mouth guard inside the patient's mouth and perform endoscopy with all due precautions and necessary protective equipment. The nipple inside the device acts as a perfect valve and prevents aerosols from escaping (► **Video 1**). We have been able to carry out both diagnostic and therapeutic endoscopies with



► **Fig. 5** Novel mouth guard in place in a triple-layer mask, ready for use.

these changes. We have demonstrated the efficacy of our device by performing a simple experiment simulating endoscopy and aerosol generation (► **Video 1**). Our device is cheap, easy to make, reusable, and allows us to do endoscopy more safely during this COVID era.

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Competing interests

The authors declare that they have no conflict of interest.

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