

Supraglottic Airway–Guided Intubation During the COVID-19 Pandemic: A Closed Technique

To the Editor

During the Coronavirus Disease 2019 (COVID-19) pandemic, minimizing aerosol generation and preventing health care worker's contamination are essential.¹ After failed intubation, supraglottic airway (SGA) insertion, followed by flexible bronchoscopic intubation (FBI) via the SGA (SGA-guided FBI [SAGFBI]), is one recommended option in the Difficult Airway Society difficult intubation guidelines.^{2,3}

We propose a potential “closed set up” version of SAGFBI, which uses an ultrasound probe cover, to form a closed system to minimize aerosol contamination.

A manikin demonstration of this “closed set up” (Figure, panel A) is as follows. A disposable 3.8-mm Ambu aScope (Ambu A/S, Baltorpbakken, Ballerup, Denmark) bronchoscope is preloaded with a 6.0-mm microlaryngeal tube. The bronchoscope handle has a connector that allows attachment of the tracheal tube. A CIV-Flex 610-637 ultrasound probe cover (CIVO, South Kalon, IA) is used, which is a 91.5 × 8.9 cm sheath. The distal end of the probe cover is cut off so that it is open-ended at both ends. The bronchoscope is inserted into the probe cover until the whole insertion cord is covered. The proximal end of the probe cover is wrapped tightly against the bronchoscope handle, with the remaining loose cuff twisted into a plait. A small Tegaderm Film (3M Deutschland GmbH; Health Care Business, Neuss, Germany) tapes both the plait and proximal end of the probe cover to the handle, forming an airtight seal. Approximately 10 cm proximal to the distal end of the probe cover, a small slit is created and the patient-end of a filter is inserted. The edges of the opening are taped around the filter, forming an airtight seal.

A size 3 Ambu Auragain (Ambu A/S, Baltorpbakken) SGA is inserted into the airway manikin. The distal end of the probe cover is pulled over the entrance of the Auragain ventilation port and taped to form an airtight seal (Figure, panel B). The anesthetic circuit is attached to the filter, thus forming a closed system. With a gas flow of 6 L/min, and the adjustable pressure-limiting valve fully open, the “closed set up” gently fills up with 100% oxygen.

SAGFBI is performed in 3 steps³: (1) bronchoscope insertion into the trachea via the SGA (Figure, panel B and panel C), (2) railroading the tracheal tube over the bronchoscope and into the trachea (Figure, panel D), and (3) removal of the bronchoscope. The distal part of the probe cover becomes folded in a concertina-like manner, which needs to be intermittently straightened out. The filter is attached to the tracheal tube to complete intubation (Figure, panel E). The probe cover is carefully detached from the filter and SGA. The bronchoscope and probe cover are then carefully discarded together as a single unit.

There are various advantages to performing “closed” SAGFBI in a COVID-19 patient. First, the “closed set up” minimizes aerosolization. Second, intubation remains “closed” throughout, that is, from insertion of the bronchoscope into the SGA and the patient's airway until attachment of the anesthetic circuit to the tracheal tube, unlike other intubation techniques. Third, 100% oxygen can be delivered to the patient by the anesthetic circuit via the filter (Figure, panel B). In addition, ventilation with low airway pressures in a correctly positioned SGA will minimize leakage from the nose and mouth.

As proposed by Cook,⁴ we suggest a 3-stage testing of this idea: (1) bench test on manikin using dye to identify aerosolization, (2) a rigorous human pilot study to test safety and effectiveness, and (3) a randomized controlled trial comparing it with standard “open” SAGFBI.

Patrick Wong, FRCA

*Division of Anesthesiology and Perioperative Sciences
Department of Anaesthesia
Sengkang General Hospital
Singapore General Hospital
Singapore*

*Department of Anaesthesia
Duke-National University of Singapore (NUS) Medical School
Singapore*

*Department of Anaesthesia
Yong Loo Lin School of Medicine
National University of Singapore
patrick.wong@singhealth.com.sg*

Wan Yen Lim, Master of Medicine (Anesthesia)

*Division of Anesthesiology and Perioperative Sciences
Department of Anaesthesia
Sengkang General Hospital
Singapore General Hospital
Singapore*

May Mok, FRCA

*Division of Anesthesiology and Perioperative Sciences
Department of Anaesthesia
Sengkang General Hospital
Singapore General Hospital
Singapore*

Conflicts of Interest: P. Wong has received airway equipment for evaluation and research from numerous companies and has lectured at conferences and symposiums sponsored by Ambu. He has no financial interest in any medical or airway companies. The remaining authors declare no conflicts of interest.

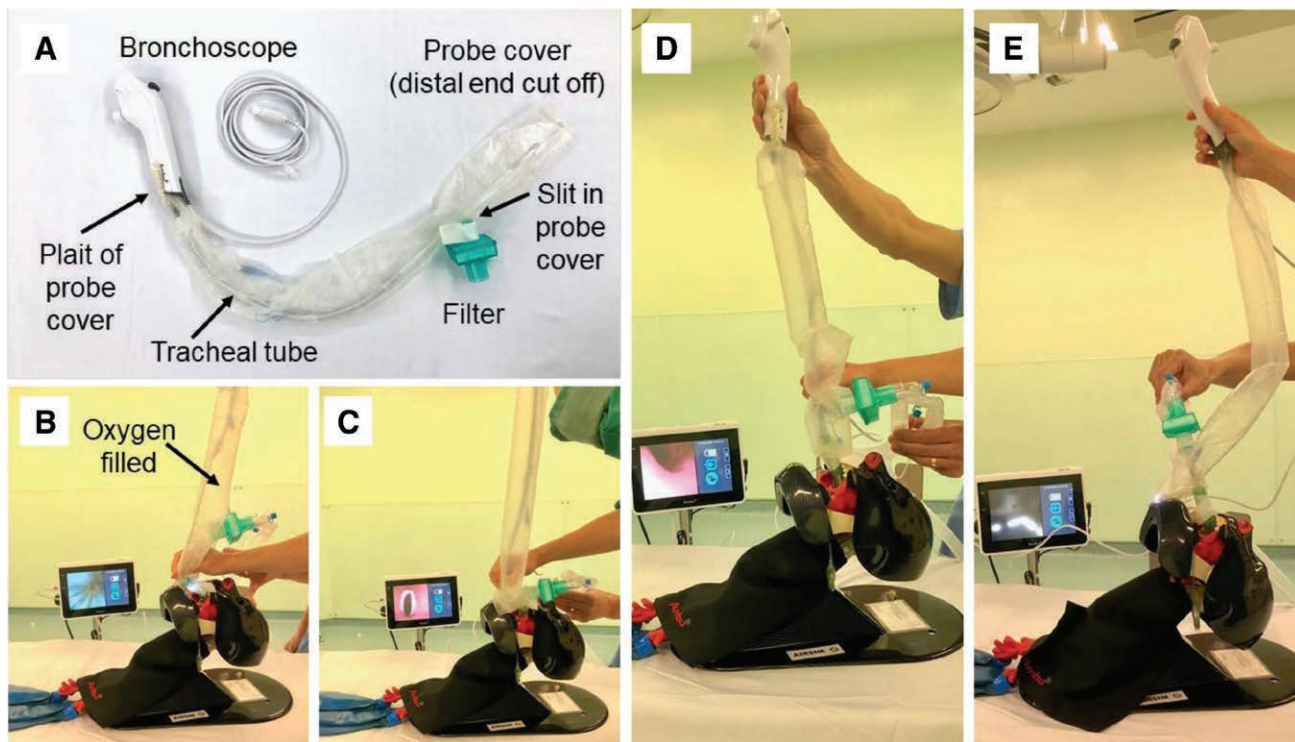


Figure. Bronchoscope/probe cover “closed set up” and intubation technique. A, The tracheal tube is preloaded on the bronchoscope. Airtight seals are made by taping the proximal end of the probe cover and plait and taping the filter inserted near the distal end. The distal end is cut to allow later attachment to the supraglottic airway. B and C, Intubation with visualization of the inside of the ventilation port and the vocal cords, respectively. The “closed set up” is filled with oxygen. D, Railroading tracheal tube over the bronchoscope and into the trachea. E, Attachment of the anesthetic filter and circuit to the tracheal tube.

Department of Anaesthesia
Duke-NUS Medical School
Singapore

Department of Anaesthesia
Yong Loo Lin School of Medicine
National University of Singapore
Singapore

ACKNOWLEDGMENTS

We thank Ambu A/S for the loan of the manikin.

REFERENCES

1. Cook TM, El-Boghdadly K, McGuire B, McNarry AF, Patel A, Higgs A. Consensus guidelines for managing the airway

in patients with COVID-19. *Anaesthesia*. 2020 [Epub ahead of print].

2. Frerk C, Mitchell VS, McNarry AF, et al; Difficult Airway Society intubation Guidelines Working Group. Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults. *Br J Anaesth*. 2015;115:827–848.

3. Lim WY, Wong P. Awake supraglottic airway guided flexible bronchoscopic intubation in patients with anticipated difficult airways: a case series and narrative review. *Korean J Anesthesiol*. 2019;72:548–557.

4. Cook TM. Novel airway devices: spoilt for choice? *Anaesthesia*. 2003;58:107–110.

DOI: 10.1213/ANE.0000000000004951