

## Adaptation to the Plastic Barrier Sheet to Facilitate Intubation During the COVID-19 Pandemic

### To the Editor

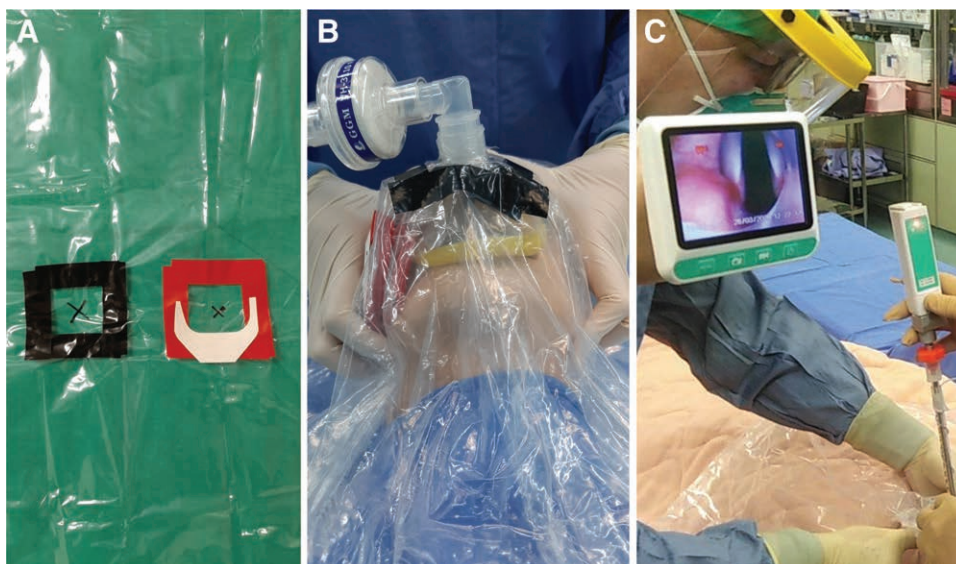
We read with interest the recent article by Brown et al,<sup>1</sup> titled "Barrier System for Airway Management of COVID-19 Patients" which described the use of a plastic drape attached to a plastic bag as a protective measure during endotracheal intubation and extubation. We wish to commend the authors on developing this technique, which has a great benefit of containing and facilitating the disposal of contaminated surfaces surrounding the patient's airway at the end of the surgical case.

Because of its close geographical proximity to China, Taiwan had been on alert for Coronavirus Disease 2019 (COVID-19) as early as December 31, 2019.<sup>2</sup> As more and more information was learned regarding the virulence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), we used a plastic drape at our institution to protect anesthesia professionals during airway manipulation but made modifications to our technique as problems arose during proof of concept and real-world use. We found that when intubation of the airway was challenging, manipulating the laryngoscope under a sheet proved to be problematic. Although Brown et al<sup>1</sup> proposed the removal of the clear drape during midlaryngoscopy as an option should difficulties with intubation arise, elimination of the barrier sheet defeats its purpose of protecting the operating room staff, and may

further aerosolize viral particles on and under the drape when it is removed in an emergent manner.

To facilitate intubation, we make the following adaptations to the plastic sheet. We cut a small 3 × 3 cm cross in the drape with a surgical blade and reinforce the perimeter of the cross with tape so it does not widen over the course of the case (Figure, panel A). The purpose of this first X is to connect the anesthesia breathing circuit to the oxygen facemask under the drape (Figure, panel B). A second 2 × 2 cm cross is cut and reinforced in close proximity to the first (Figure, panel A). The purpose of this second X is for passage of the videolaryngoscope, endotracheal tube, or Yankauer suction tip.

At our institution, we use the Trachway video light stylet (Markstein Sichtec Medical Corp., Taichung, Taiwan) as the preferred video-assisted intubating device (~5000 cases in 2019). Because of its small profile, only a small X is needed to introduce the intubating device and endotracheal tube (Figure, panel C). When using the video stylet, we cover the second cross with a small transparent film dressing, making a small nick in the center of the dressing with a surgical blade. As the stylet and endotracheal tube are introduced, the hole in the film will dilate in size to accommodate the endotracheal tube, while the elasticity of the dressing allows it to adhere around the tube, minimizing the defect in the plastic barrier. If a videolaryngoscope is utilized for intubation, the cross is widened to 3 × 3 cm to accommodate passage of both the disposable blade and the endotracheal tube. A transparent dressing should not be utilized with videolaryngoscopy as the film's adhesive nature may interfere with the maneuvering of laryngoscope or endotracheal tube, but a dressing can be placed



**Figure.** Adaptation to plastic sheet to facilitate endotracheal intubation. A, Two diagonal crosses are cut into the drape and reinforced with tape. B, First cross allows connection of breathing circuit to oxygen facemask. C, Second cross allows introduction of video stylet and endotracheal tube.

over the X after successful intubation to reduce the size of the defect in the plastic sheet. Typical airway maneuvers, such as jaw thrust by an assistant, can still be performed over the sheet. If mask ventilation is needed after an initial laryngoscopy attempt, we can easily shift the plastic drape back over to the first cross to allow resumption of mask ventilation.

A benefit of utilizing a plastic sheet as the barrier device is that it is simple and inexpensive and can be constructed with existing materials in the hospital, such as a surgical drape or even a plastic trash bag. The use of a transparent acrylic intubation shield has been proposed and may afford improved visibility but would require construction of the device as well as disinfection of the unit after each use.<sup>3</sup> In addition, patient anatomy may preclude effective manipulation of the airway through the 2 circular openings. A potential negative aspect of our modified drape technique is the theoretical transmission of viral particles into the operating room through the defect in the barrier. However, we feel that the risk of contamination is low, and our modified technique improves the success rate of the initial intubation attempt, especially when a difficult airway is encountered. If additional protection is desired, using 2 plastic drapes as a double layer can further reduce the risk of accidental transmission, as the Xs on both sheets would have to be aligned in order for aerosolization of viral particles to occur.

Although we have been carefully removing the drape after successful intubation, we feel that Brown et al<sup>1</sup> and other authors make an excellent point that the sheet can be left in place for the duration of surgery, and the patient can be subsequently extubated under the drape, shielding anesthesia providers and

other operating room personnel when the endotracheal tube is removed.<sup>4</sup> During these trying times, it is encouraging to see how health care professionals over the globe are readily sharing clinical insights, and we hope that our experiences with a simple modification to the barrier sheet method may help others improve their success rate of initial intubation while still providing protection to anesthesia professionals during the COVID-19 pandemic.

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