Letter to Editor

Endoscopy mask for safe extubation in patients with COVID-19

Dear Editor,

The risk of spreading coronavirus disease 2019 (COVID-19) virus through aerosol generating procedures (AGPs) is well documented.\textsuperscript{[1]} Intubation and extubation are high AGPs, which are of major concern for an anesthesiologist and intensivists due to proximity to the patient. Recently various recommendations for anesthetic management of COVID-19 patients has been published.\textsuperscript{[1,2]} These recommendations mainly focus towards safe tracheal intubation with less emphasis on safe extubation.

Figure 1: Endoscopy mask with the silicon membrane and a small self-sealing hole with a cap (yellow arrow)

\textsuperscript{[1]} Liew MF, Siow WT, Yau YW, See KC. Safe patient transport for COVID-19. Crit Care 2020;24:94.

\textsuperscript{[2]} Bouadma L, Lescure FX, Lucet JC, Yazdanpanah Y, Timsit JF. Severe SARS-CoV-2 infections: Practical considerations and management strategy for intensivists. Intensive Care Med 2020;46:579-82.

\textsuperscript{[3]} Qiu H, Tong Z, Ma P, Hu M, Peng Z, Wu W, Du B. Intensive care during the coronavirus epidemic. Intensive Care Med 2020;46:576-8.

\textsuperscript{[4]} Liew MF, Siow WT, MacLaren G, See KC. Preparing for COVID-19: Early experience from an intensive care unit in Singapore. Crit Care 2020;24:83.
techniques. We believe that adequate dose muscle relaxants during laryngoscopy and intubation prevents coughing thus limiting aerosol generation. In contrast, the aerosol generation is much more during extubation than that of intubation due to the high incidence of coughing and bucking.

Strategies like avoiding extubation inside the OR or extubation in a negative pressure room may prevent contamination but are not always feasible. Use of portable barrier hood devices[3] mask over the endotracheal tube (ETT) technique[4] and passing the ETT through the port, of a standard face mask,[5] have been described to minimize exposure during extubation, however, these techniques have limitations and are not full-proof. Hence, we describe a technique of extubation using endoscope mask (VBM Medizintechnik GmbH, Germany) [Figure 1], which further minimizes aerosol exposure despite proximity to the patient.

**Extubation Technique**

All providers managing extubation in COVID-19 patients should wear full personal protective equipment (PPE). Assessment for the readiness of extubation is crucial as rescue strategies are associated with increased risk of exposure.

Before extubation, an adequate size endoscopy mask is placed over the patient’s face by inserting the ETT through the membrane port of the endoscopy mask, after clamping the ETT at the angle of mouth [Figure 2a and b]. The membrane port of the endoscopy mask has a silicon membrane and a small self-sealing hole with a cap [Figure 1], which ensures a proper seal around the ETT. A viral filter is attached to the airway port of the endoscopy mask [Figure 2c]. At the time of extubation, a proper seal with the endoscopy mask is ensured before the deflation of the ETT cuff [Figure 2d]. The ETT is removed through the hole in the silicon membrane of the endoscopy mask. The hole in the silicon membrane is capped by the assistant and the close circuit is detached from the ETT distal to viral filter [Figure 2e]. The circuit is reattached to the viral filter, which is attached to the airway port of the endoscopy mask [Figure 2f].

Advantages of using endoscopy mask during extubation in COVID-19 patients are: the small self-sealing hole in the silicon membrane of the mask ensures adequate seal around the ETT and the flexible corrugated airway port of the mask can be diverted away from the person standing at the head-end, during extubation. We found this technique simple and effective and did not find any difficulty in testing this technique in a mannequin and non-COVID patients. The only limitation of this technique is that an additional viral filter is required to ensure adequate protection.

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**Conflicts of interest**
There are no conflicts of interest.

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Safety tent for enhanced personal protection from aerosol-generating procedures while handling the COVID-19 patient airway

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The world is going through the COVID-19 pandemic, which has high virulence and transmission rate. More significant the viral load during exposure, the greater is the likelihood of contracting a severe disease. Healthcare workers (HCWs) involved in airway care of COVID-19 patients are at high risk of getting exposed to large viral loads during aerosol-generating actions such as coughing or sneezing by the patient or during procedures such as bag-mask ventilation, intubation, extubation, and nebulization. This viral load exposure to airway caregivers decreases considerably with the use of an aerosol box during intubation. The safety tent proposed in this article is useful in limiting the viral load that HCWs are exposed to during airway procedures. Its role can be expanded beyond just intubation to protect against all aerosol-generating actions and procedures involving the patient’s airway.

Keywords: Aerosol generating procedures, COVID-19, intubation box, safety tent

Abstract

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