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References

1. Jelic S, Cunningham JA, Factor P: Clinical review: Airway hygiene in the intensive care unit. Crit Care 2008; 12:209
2. Cook TM. Personal protective equipment during the coronavirus disease (COVID) 2019 pandemic - A narrative review. Anaesthesia 2020; 75:920–7
3. Vargas M, Servillo G: Improving staff safety during tracheostomy in COVID-19 patients. Head Neck 2020; 42:1278–9
4. Ranney ML, Griffeth V, Jha AK: Critical supply shortages - The need for ventilators and personal protective equipment during the Covid-19 pandemic. N Engl J Med 2020; 382:e41

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Pandemic Bronchoscopy

A Technique to Improve Safety

To the Editor:

The spread of coronavirus disease 2019 (COVID-19) and the concern for procedure-related aerosolization has inspired innovative techniques to minimize contamination and spread. For example, Markin *et al.* utilized a modification to a transesophageal echocardiography probe sheath setup to improve safety during transesophageal echocardiography use.[1] Similarly, a modified ultrasound probe cover can be utilized in intubated patients for the rare instances when bronchoscopy is required.

Current guidelines recommend postponing all elective bronchoscopies and, when mandated, performing them in a negative pressure isolation room and with appropriate personal protective equipment.[2,3] In addition to following these guidelines, and with the use of a disposable bronchoscope, safety can be enhanced by novel use of a modified ultrasound probe cover (fig. 1). First, an elbow connector with bronchoscopy port is placed into an ultrasound probe cover, and small cuts are made into the cover for the elbow ports (fig. 1, A and B). Next, tape is used to create a seal at the ports (fig. 1C). It is easy to add a dressing into the probe cover at this time for later cleaning of the bronchoscopy camera or to assist in flushing the working channel, should it be required (fig. 1C). This completely seals the distal end of the bronchoscope setup. Once this is done, the elbow with bronchoscopy port should be connected to the ventilator circuit and endotracheal tube. The bronchoscope is then inserted into the probe cover, the proximal end sealed and bronchoscopy performed (fig. 1D). This creates a closed-circuit bronchoscopy setup, minimizing aerosolization to the environment, droplet spread, and contamination of the bronchoscopists' hands. When the procedure is complete, the elbow connector setup is removed and the disposable bronchoscope, ultrasound cover, and elbow are all disposed of as one (fig. 1E).

Critically, this adaptation does not solve aerosolization and contamination when attaching the elbow connector with bronchoscopy port setup to the ventilator-patient circuit. For this portion of the procedure we advise speed, short-acting paralytic administration, consideration of tube clamping to decrease breaths into the atmosphere, and a towel and/or drape over the endotracheal tube during disconnection with or without adjunctive suction to this region.

To our knowledge, this approach comes closest to a "closed circuit" setup using readily available equipment, and enables both ease of setup and disposal. Francom *et al.* described use of very large disposable drapes over mayo stands, IV, poles or metal bars to create a "bronchoscopy tent" in order to cover the bed, body, and head in the operating room.[4] This approach, however, is less efficient and not practical in the intensive care unit. Yaghchi *et al.* described the use of in-line suction system to assist during percutaneous tracheostomy, but the setup would not offer the mobility mandated for bronchoscopy and again is less practical in an intensive care unit environment.[5]

Although this strategy augments safety, bronchoscopy is clearly a high-risk procedure for COVID-19 spread *via* droplets and aerosols. Any bronchoscopy should be warily considered and avoided whenever possible. If unavoidable, however, every technique at our disposal should be utilized to minimize patient, provider, and environmental transmission.

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Competing Interests

The authors declare no competing interests.

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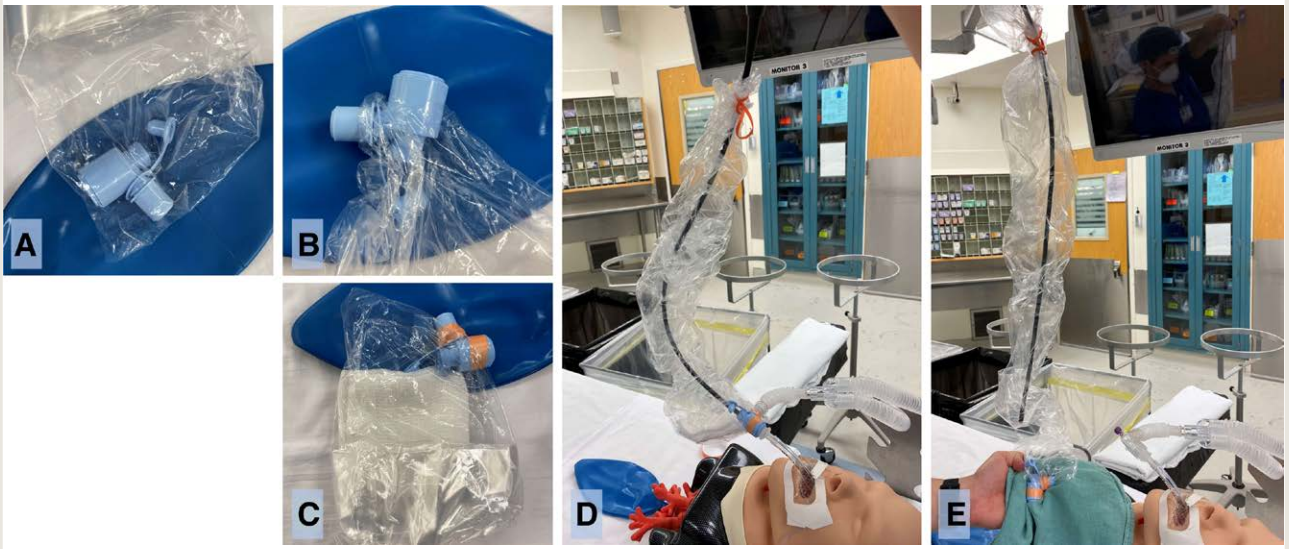

Fig. 1. Stepwise approach to a closed-circuit, easily disposable bronchoscopy setup for use in high-risk situations, such as coronavirus disease 2019 (COVID-19). (*A*) Elbow adaptor is first placed inside transesophageal echocardiography sheath. (*B*) Small holes are cut to allow each arm of adaptor to fit through. (*C*) Tape is used to secure sheath to adaptor and gauze is placed inside sheath. (*D*) Bronchoscopy set-up shown. (*E*) Easy scope disposal after procedure is terminated.

References

1. Markin NW, Cawcutt KA, Sayyed SH, Rupp ME, Lisco SJ: Transesophageal echocardiography probe sheath to decrease provider and environment contamination. Anesthesiology 2020. doi: 10.1097/ALN.0000000000003370 [Epub ahead of print]
2. Pritchett MA, Obert CL, Belanger A, De Cardenas J, Cheng G, Nacheli GC, Franco-Paredes C, Singh J, Toth J, Zgoda M, Folch E: Society for Advanced Bronchoscopy consensus statement and guidelines for bronchoscopy and airway management amid the COVID-19 pandemic. J Thora Dis 2020;12. https://doi.org/10.21037/jtd.2020.04.32
3. Wahidi MM, Shojaee S, Lamb CR, Ost D, Maldonado F, Eapen G, Caroff DA, Stevens MP, Ouellette DR, Lilly C, Garder DD, Glisinski K, Pennington K, Alalawi R: The use of bronchoscopy during the COVID-19 pandemic: CHEST/AABIP guideline and expert panel report. Chest 2020. https://doi.org/10.1016/j.chest.2020.04.036
4. Francom CR, Javia LR, Wolter NE, Lee GS, Wine T, Morrissey T, Papsin BC, Peyton JM, Matava CT, Volk MS, Prager JD, Propst EJ: Pediatric laryngoscopy and bronchoscopy during the COVID-19 pandemic: A four-center collaborative protocol to improve safety with perioperative management strategies and creation of a surgical tent with disposable drapes. Int J Pediatr Otorhinolaryngol 2020; 134:110059
5. Yaghchi CA, Ferguson C, Sandhu G: Percutaneous tracheostomy in patients with COVID-19: Sealing the bronchoscope with an in-line suction sheath. Br J Anaesth 2020. https://doi.org/10.1016/j.bja.2020.04.068

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Low-cost Double Protective Barrier for Intubating Patients amid COVID-19 Crisis

To the Editor:

Amid the actual crisis of coronavirus disease 2019 (COVID-19), anesthesiologists are faced with the necessity to improvise extra protective barriers for

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