

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,

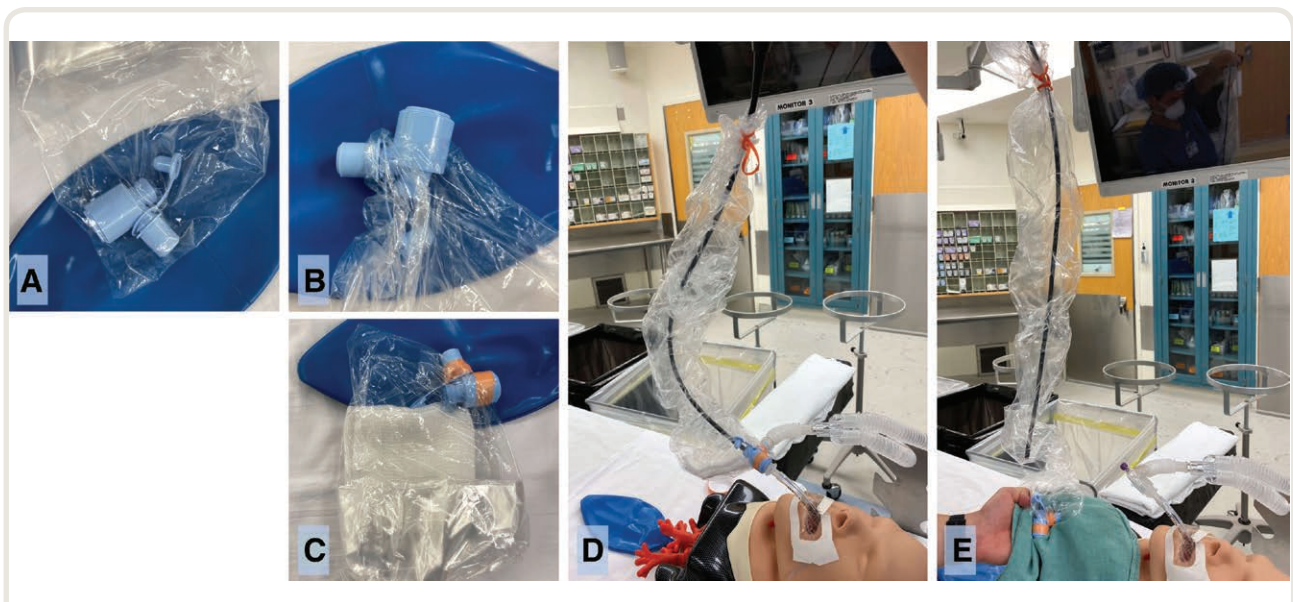


Fig. 1. Stepwise approach to a closed-circuit, easily disposable bronchoscopy setup for use in high-risk situations, such as coronavirus disease 2019 (COVID-19). (A) Elbow adaptor is first placed inside transesophageal echocardiography sheath. (B) Small holes are cut to allow each arm of adaptor to fit 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.

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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