A Cost-effective Solution to Limit Aerosol Transmission of Infectious Agents During Mastoid Drilling

To the Editor: We read with interest the research letter published online on April 28, 2020, titled “A Simple Technique for Droplet Control During Mastoid Surgery.”1 Mastoid bone drilling is an aerosol-generating procedure with the potential to transmit infectious agents from the upper aerodigestive tract via the eustachian tube and middle ear. Although there are no coronavirus disease 2019–specific data, other studies have found common viruses in the middle ear and nasopharynx.2-4

To continue safely with emergency mastoid surgeries and other time-critical surgeries involving mastoid bone drilling during this period, we have also devised a cost-effective solution to limit aerosol transmission to the surgeon and other personnel in the operating room.

The microscope used during mastoid bone drilling is routinely covered with a sterile clear drape. Excess material is cut off from the far end of this sterile drape and then used to secure to the microscope lens using clear adhesive dressing (Tegaderm). The other end is then secured around the operative field and over the water-collection bag. A tent-like shield is thus created. Small slits are cut on either side of this tent to accommodate the 2 hands of the surgeon.

Although this is not a perfect system, it manages to contain most, if not all, of the droplets generated during surgery. It is readily available, simple to set up, and does not incur any additional cost.

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To the Editor: We were interested by the recent article by Carron, et al “A Simple Technique for Droplet Control During Mastoid Surgery”1 because we have also been considering the challenges of performing mastoidectomy in the coronavirus disease 2019 era. Mastoidectomy is an aerosol-generating procedure (AGP) owing to the use of drills and presence of potentially virus-containing respiratory mucosa lining the mastoid air cells.2 The recommended personal protective equipment for AGPs is a FFP3 mask and a face visor to prevent aerosolized particles coming into contact with mucosal surfaces of the face, including the nose, mouth, and eyes.3 As the authors point out “using a microscope with a face shield is virtually impossible.”1 Clamp and Broomfield4 quantified this, demonstrating that face shields reduced the surgical view to a median of 4%. Although the use of plastic drapes are an alternative to a face shield, they are somewhat problematic.1 Instruments have to be passed beneath the drapes by the scrub nurse, which is slow and cumbersome.2 The seal is not airtight, and lifting drapes to change instruments releases viral particles into the theater environment.3 Third, there is the contamination risk to the surgical team and environment when removing the drapes afterwards.

Swimming goggles provide a low-cost solution:

- The surgeon can get sufficiently close to the microscope to not restrict the field of view (surgeon able to visualize 98% of the target visualized with no eye protection).2 They provide an airtight and watertight seal thus preventing severe acute respiratory syndrome coronavirus 2 virus particles from coming into contact with the eye.

- An FFP3 mask is used in addition to protect the nose and mouth.4 Prescription contact lenses may be worn with the goggles, and prescription goggles are also available.

- Goggles can be kept on for the entire procedure (even when not using the microscope), avoiding potential contamination by repeated donning and doffing.

- Goggles can be reused after cleaning with a suitable antiviral agent, such as ethanol spray, which rapidly inactivates the encapsulated virus.5

- Doffing the goggles requires a 2-person technique to avoid self-contamination.

We demonstrate a low-cost solution for mastoid surgery that provides an airtight seal to prevent viral particles contacting the clinician’s eyes, while allowing the surgeon to get sufficiently close to the microscope that the view is not impaired.

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In Reply We thank Thong et al for their letter. We chose our method because it allows easy setup and takedown for continued microscope use after drilling is complete. We have taken to using the Sterile-Z Back Table Drape because it has a perforation down the middle to allow for easy break-away when it is no longer needed. As stated in our original Research Letter, we expect better modifications to come about, and otolaryngologists will always be a creative group.

We appreciate the alternative suggestion from Warner et al. Contamination of the facial and/or forehead skin with droplets would still need to be carefully treated using their method, and those of us who wear glasses but cannot wear contact lenses would not be able to use swim goggles.

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Tracheostomy During COVID-19 Pandemic—In Search of Lost Timing

To the Editor Tay et al should be complimented on their Viewpoint “Surgical Considerations for Tracheostomy During the COVID-19 Pandemic: Lessons Learned From the Severe Acute Respiratory Syndrome Outbreak,” highlighting preoperative and perioperative recommendations for tracheostomy during the coronavirus disease 2019 (COVID-19) pandemic. The authors searched the literature for tracheostomies performed during the previous outbreak of severe acute respiratory syndrome (SARS), finding 3 case series and 2 case reports (23 procedures). Lessons learned from those experiences were summarized into 5 points. The need for adequate personal protective equipment in performing surgery, the site to perform surgery to lessen transport of infected patients, the precautions to reduce time of exposure to infective secretions, the establishment of experienced teams, and the caution in postprocedure waste disposal were discussed and translated to the current COVID-19 pandemic.

Of note, the authors’ recommendations focused on maximizing the safety of clinicians, which is undoubtedly a crucial aspect. For example, delaying tracheostomy until complete virus clearance has been proposed to minimize the risk of clinician infection. However, there is little to no consideration of patients’ perspective. Would patients with COVID-19 benefit from tracheostomy? This question remains unanswered, and none of the studies presented data on tracheostomy best timing in these patients.

Sparsely randomized clinical trials (RCTs) involving patients with different underlying conditions have compared outcomes between early vs late tracheostomy, with inconsistent results. A large Italian RCT reported no significant differences in ventilator-associated pneumonia, mortality, and length of intensive care unit (ICU) stay between the early (6-8 days from endotracheal intubation) and late (13-15 days) tracheostomy groups. Conversely, in an RCT including patients with neurological conditions in an ICU, early tracheostomy (<3 days) provided significantly lower intensive care unit (ICU) mortality, 6-month mortality, and use of sedatives. In their meta-analysis comprising 222501 adult patients with prolonged intubation, Adly et al showed that early tracheostomy (<7 days) was significantly associated with better outcomes, including mortality rate, incidence of hospital-acquired pneumonia, duration of mechanical ventilation, and length of ICU stay.

Although there is general agreement that optimizing safety protocols for tracheostomy in patients with COVID-19 is of utmost importance, data on tracheostomy best timing in these patients is still lacking. Would early tracheostomy in patients with COVID-19 improve weaning, disease clinical course, and/or reduce ICU stay? This remains nebulous, and significant variability—even regarding percutaneous vs surgical tracheostomy techniques—exists in the clinical practice.

We congratulate the authors on their contribution and look forward to further research investigating safety and potential advantages for early tracheostomy in patients with COVID-19.

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