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Correspondence

Preoperative apnea trial and considerations regarding timing of tracheostomy in anesthetic planning for patient with COVID-19 disease



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We read the correspondence by Parekh and Lai [1] with great interest. We commend the authors for their particular attention to steps involved in preoperative planning, designed to reduce staff infection risks [2]. We wish to highlight a valuable preoperative consideration for planning tracheostomy that was unexplored: assessment of the patient's ability to tolerate apnea, which can help in determining candidacy and timing for tracheostomy.

One of the strategies that Parekh and Lai suggest for reducing risk of infectious aerosols during tracheotomy is pausing the ventilator prior to opening, instrumenting, or cannulating the trachea [1,3,4]. This excellent recommendation should be explored further, as there are different interpretations. Firstly; pausing the ventilator without circuit disconnection likely maintains PEEP in the breathing circuit (depending on ventilator and/or settings), which maintains oxygenation and limits de-recruitment, but risks aerosolization. Secondly; stopping ventilation and allowing decompression of the breathing circuit (by turning the ventilator to a 'stand-by' mode or opening any adjustable pressure-limiting expiratory valves) leads to de-recruitment and desaturation, but aerosolization is minimized. Thirdly; full disconnection of the breathing circuit rapidly decompresses the trachea, creating the lowest risk of aerosolization from the operative field, but leading to more rapid de-recruitment and desaturation. Care must be taken at the disconnection point, which should be distal to a viral filter in the breathing circuit.

There are trade-offs among each of these approaches, and ability of the patient to tolerate any strategy will depend on respiratory reserve and pulmonary status. Given the logistical complexity of arranging transfer to an operating room; exposure risks to staff; transfer risks to the patient; and concern for critical desaturation, assessment of physiological readiness to undergo an apneic tracheostomy prior to surgery is highly desirable. A strategy for assessing readiness for tolerating apnea (preoperative apnea trial) has been recently described and recommended by an international, multidisciplinary panel of

tracheostomy experts [4].

The preoperative apnea trial involves pre-oxygenation followed by a trial of apnea in the ICU, simulating the physiological conditions the patient would be exposed to during surgery. Supine positioning is helpful in creating the anticipated conditions. Rapid desaturation predicts a similar response during tracheostomy, and tracheostomy should be deferred. Furthermore, the details of such evaluation, including information on the patient's reserve, can allow refinement of intraoperative planning for those patients who are candidates for tracheostomy. For example, duration of apnea and tolerable degree of desaturation can be agreed beforehand with the surgical or procedural team. For spontaneously breathing patients, a bolus of opioid may be sufficient to minimize spontaneous ventilation for the test. Adequate time between the test and the tracheotomy procedure is necessary to allow for re-recruitment and to optimize the patient's gas exchange prior to the procedure.

Finally; opening the trachea during tracheotomy effectively breaks the continuity of the breathing circuit. It is likely that a percutaneous or hybrid dilatational approach causes a smaller (more sealable) defect than an open surgical approach. So, pausing a ventilator and inserting a tracheostomy tube will lead to inevitable transient loss of PEEP and desaturation, but the nature of the 'pause' required is likely influenced by technique.

In summary, we strongly encourage use of an apnea trial to assess readiness for tracheotomy in patients with COVID-19 who have high PEEP and high oxygen requirements, and suggest a multidisciplinary, patient-centered approach to preoperative planning. While performing tracheotomy is a discrete event, a multidisciplinary approach to care reduces adverse events and mortality while markedly decreasing length of stay and costs [5]. While forthcoming data will help define best practice, Parekh and Lai deserve praise for providing a reliable roadmap for safely performing tracheostomy during the pandemic era.

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Paolo Pelosi, MD, FERS	Drafting and analysis and interpretation of data for the work; critically revising the work for important intellectual content; approval of the final submission; agreement to be accountable for all aspects of the work.
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