

Correspondence

Laryngeal oedema associated with COVID-19 complicating airway management

We would like to highlight the apparent potential of the SARS-CoV-2 virus in causing airway oedema and laryngitis; particularly of relevance when managing the airways of critically ill patients suffering from COVID-19. This is relevant to colleagues intubating and extubating the tracheas of critically ill patients and also to colleagues from ENT who may be asked to provide opinions on airway oedema around the time of tracheal extubation. In our tertiary UK hospital, staff have intubated the tracheas of more than 30 patients to date and we have experienced one failed intubation due to airway oedema and two (of eight) patients have developed stridor following tracheal extubation. Both stridulous patients required tracheal re-intubation; one was successfully extubated 48 h later, and one required subsequent tracheostomy. An additional patient with suspected laryngeal oedema underwent a period of review and then proceeded to tracheostomy without a trial of tracheal extubation.

Anecdotally, our anaesthetic colleagues have found many of these tracheal intubations in the critically ill 'difficult' which we have attributed to the unfamiliar working environment, the personal protective equipment and the physiological and logistical challenges of intubating critically ill patients' tracheas [1, 2], in contrast to the usual work-load of many anaesthetists. Subtle airway oedema may be important here and we recommend that those managing the airways of patients with confirmed or suspected COVID-19 consider that the airway may be technically challenging as a result. We are aware of anecdotal reports of laryngeal ulceration in COVID-19 patients, a phenomenon not usually associated with tracheal intubation.

Laryngeal oedema is not uncommon in the critically ill and is reported in up to 55% of patients following tracheal extubation [3]. It can appear as early as 24 h, and the incidence increases with the duration of tracheal intubation [4]. Coronaviruses are a known cause of laryngitis but the SARS-CoV-2 virus does not typically cause a sore throat [5]. In the latter three patients described above, there had been no documented tracheal intubation problems and appropriately-sized tracheal tubes had been used for

7 days, 8 days and 13 days, respectively, before tracheal extubation or tracheostomy. Airway oedema was not suspected in the two patients whose tracheas were extubated, and no formal 'leak test' had been undertaken.

The use of subglottic suction tracheal tubes should be encouraged in this patient group, but these tubes add additional bulk to the tube diameter. This may be a subtle factor in contributing to airway oedema when the larynx is inflamed. Before tracheal extubation, we recommend deflating the tube cuff while still receiving ventilatory support in order to assess for a 'leak' (as a surrogate of later airway patency), although this should be considered an aerosol-generating procedure. We also recommend that staff plan for airway oedema, stridor and the need for possible tracheal re-intubation following a trial of extubation, recognising that this may create additional logistical problems in the COVID-19 population. The benefits of standard therapies, such as dexamethasone to treat oedema in the setting of COVID-19, are unknown.

In conclusion, during this pandemic, we encourage colleagues to prepare for difficulties during tracheal intubation and extubation, to be vigilant and actively look for post-extubation dysphagia and dysphonia, and to seek early advice from colleagues in head and neck surgery and in speech and language therapy.

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References

1. Higgs A, McGrath BA, Goddard C, et al. Guidelines for the management of tracheal intubation in critically ill adults. *British Journal of Anaesthesia* 2018; **120**: 323–52.
2. Higgs A, Cook TM, McGrath BA. Airway management in the critically ill: the same, but different. *British Journal of Anaesthesia* 2016; **117**(Suppl. 1): i5–9.

3. Zhou T, Zhang HP, Chen WW, et al. Cuff-leak test for predicting postextubation airway complications: a systematic review. *Journal of Evidence Based Medicine* 2011; **4**: 242–54.
4. Lake M. What we know so far: COVID-19 current clinical knowledge and research. *Clinical Medicine* 2020; **20**: 124–7.
5. Brodsky M, Levy MJ, Jedlanek E, et al. Laryngeal injury and upper airway symptoms after oral endotracheal

intubation with mechanical ventilation during critical care: a systematic review. *Critical Care Medicine* 2018; **46**: 2010–7.

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