Early percutaneous tracheostomy for patients with COVID-19

The COVID-19 pandemic has led to unprecedented demand for critical care. Early tracheostomy may reduce the duration of mechanical ventilation, intensive care unit length of stay and sedative requirements and facilitate resource management during the pandemic. Although standard UK practice is to consider tracheostomy after 7–10 days, COVID-19 guidelines advise balancing the complications of prolonged tracheal intubation vs. the risks of viral exposure for staff and waiting for 14 days after tracheal intubation and a negative SARS-CoV-2 antigen test [1]. However, the rate of failed tracheal extubation observed in patients with COVID-19, with possible associated negative outcomes, may favour weaning via earlier tracheostomy.

We believe that, with precautions, early percutaneous tracheostomy can be safe for patients with COVID-19 and for staff, and describe our experience of 29 percutaneous tracheostomies between 19 March and 14 April 2020 at our Trust. Baseline characteristics are presented in Table 1. Overall, staff safety was maintained, there were no complications during any of the procedures, and sedative and vasopressor requirements decreased substantially following tracheostomy.

Potential for transmission was minimised by using full personal protective equipment for aerosol-generating procedures and a modified percutaneous technique. Aerosol generation was reduced by switching the ventilator to standby at key points and performing tracheostomy with minimal delay under apnoeic conditions. The same experienced operator performed every tracheostomy, and received a negative SARS-CoV-2 antibody test result 2 months after the last tracheostomy. No other member of the treating team developed COVID-19 symptoms or received a positive test result within 2 weeks of a tracheostomy. Reassuringly, this is echoed in nationwide data, with no instances of COVID-19 infection among tracheostomy operators (Hamilton et al., preprint: https://www.medrxiv.org/content/10.1101/2020.05.22.20104679v1).

Table 1 Characteristics of 29 patients who received a tracheostomy. Values are number (proportion) or median (IQR [range]).

Sex; male	25 (86%)
Black, Asian or Minority Ethnic	4 (14%)
Age; years	66 (59–70 [36–82])
BMI; $kg.m^{-2}$	27.6 (24.6–32.0 [21.2–54.0])
Days of ventilation before tracheostomy	4 (2–8 [1–13])
Co-existing conditions	
Any co-existing condition	22 (76%)
Hypertension	12 (41%)
Diabetes	6 (20%)
Asthma	6 (20%)
Chronic obstructive pulmonary disorder	0
Obesity	12 (41%)

Further, we found early tracheostomies can be performed safely in patients with COVID-19. Our median time to tracheostomy was 4 days after tracheal intubation, and there were no peri-operative complications in our cohort. It is our usual practice to use a percutaneous technique, which allowed procedures to take place at the patient bed-side in an area already designated for COVID-19. A percutaneous technique is also associated with a lower complication rates than surgical techniques in both COVID-19 and non-COVID-19 patients [Hamilton et al., preprint: https://www.medrxiv.org/content/10.1101/2020.05.22.20104679v1, 3]. Despite initial concerns, we actually found it easier to prone patients who had a tracheostomy, rather than a tracheal tube, when we used prone head supports, chest and pelvic rolls. All 29 tracheostomies were secured with sutures in addition to a tracheostomy-securing device.

Finally, there was a substantial decrease in sedation and vasopressor requirements following tracheostomy. Sedation decreased from a median of more than 10 $mg.h^{-1}$ of both morphine and midazolam, or equivalent sedatives, while intubated to less than 5 $mg.h^{-1}$ during each of the 5 days after tracheostomy, with 48% of patients requiring zero sedation. In addition, noradrenaline requirements decreased from 5 to 0 $\mu g.min^{-1}$ over 5 days. In our experience, without tracheostomy these patients would have remained on higher doses of both for a longer period. At our peak, we experienced shortages of sedatives, vasopressors and syringe drivers as we ventilated patients at 660% of our usual level 3 capacity. Early tracheostomy may preserve resources for other current and future patients during a pandemic without compromising patient or staff safety. It also facilitated earlier rehabilitative physiotherapy. With our local neurological rehabilitation centre, we

established a step-down ward to treat patients with tracheostomies, although ultimately only one patient was not decannulated before step-down.

Waiting for 14 days may avoid tracheostomy for subsequent non-survivors but it could negate the benefits outlined above. In addition, increased duration of mechanical ventilation, particularly if using anaesthetic machines, may have associated complications, such as delirium and longer-term psychological sequelae.

In summary, we found that early tracheostomy can be performed in a way that is safe and potentially beneficial for patients and healthcare staff. We suggest that decisions regarding tracheostomy for patients with COVID-19 should be based on the best interests of the patient on a case-by-case basis, whereas maintaining the safety of the healthcare team; an approach we aspire to for all of our intensive care patients.

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PROSPECT guidelines for oncological breast surgery: the role of non-opioid analgesics

We thank Jacobs et al. for the new PROSPECT guidelines for oncological breast surgery [1]. These recommendations are very helpful for clinicians, as they summarise all available randomised controlled trials published to date on anaesthetics, analgesics, co-analgesics and local/regional techniques, as well as surgical interventions assessing postoperative pain after breast cancer surgery.

PROSPECT recommends that "*Systemic analgesia should include paracetamol and NSAIDs administered pre-operatively or intra-operatively and continued postoperatively.*" Although we agree with this statement based on clinical experience, there is scant evidence from randomised controlled trials investigating non-opioid analgesics, for example, data underlining the efficacy of pre-operative administration, or showing that the combination of paracetamol and an NSAID improves analgesia compared with one drug alone.

Three studies led PROSPECT to recommend paracetamol (grade B evidence) and conventional NSAIDs (grade A evidence). These rather underpowered pharma-sponsored studies do not provide sufficient evidence to support the recommendations [2–4]:

In the study by Kampe et al., paracetamol and metamizole were found to be equivalent (primary endpoint pain scores at rest 4–30 h) [2]. With only 20 patients per group and some weaknesses in of the study design (e.g. 10-kg difference in body weight between groups, no data for the first four postoperative hours), we agree with Jacobs et al. that these results are not sufficient to draw definite conclusions. Although blinding of study medication is more convenient if study drugs are administered every 6 h (4 $g.day^{-1}$), it has to be emphasised that in contrast to paracetamol (maximum 4 $g.day^{-1}$ for patients > 50 kg body weight, 60 $mg.kg^{-1}$ for weight < 50 kg), the maximum adult intravenous daily dose of metamizole is 5 $g.day^{-1}$. Thus, the maximum dose of metamizole was not fully utilised, whereas patients weighing 40–50 kg received high doses of paracetamol.

In a second study, 24-h morphine consumption did not differ for paracetamol, metamizole and placebo administered intra-operatively and 4, 10 and 16 h after surgery [3]. Eleven patients (40.7%), five patients (19.2%, not 4%) and one patient (3.9%) in the paracetamol, metamizole and placebo groups, respectively, did not need any

