

COVIDTrach; the outcomes of mechanically ventilated COVID-19 patients undergoing tracheostomy in the UK: Interim Report

Editor

COVIDTrach is a UK multidisciplinary collaborative project that evaluates the outcomes of tracheostomy in patients diagnosed with COVID-19 who are receiving invasive mechanical ventilation. In parallel, data is collected on the use of personal protective equipment (PPE) and rates of COVID-19 infection amongst operators. Between 6th April and 11th May 2020, data was received on 564 tracheostomies from 78 UK NHS hospitals. Results are given in brackets as a fraction of results received (n = results/number of results received).

The majority of patients were male (n = 405/563, 72%) and BMI ranged from 18.5 to <25 (22%), 25 to <30 (35%), 30 to <40 (35%) and >40 (8%) (data available in 426 cases). The number of days from intubation (day 0) to tracheostomy ranged from 0–35 (median 16, IQR 13, 22) (data available in 543 cases). Prior to tracheostomy, the median FiO₂ was 40% (IQR 30, 45) (data available in 555 cases) and the median PEEP was 8 (IQR 6, 10) (data available in 539 cases). An open method of tracheostomy was used in 58% of cases (n = 323/560), a percutaneous method in 39% (n = 217/560) and a hybrid method was used in 3% (n = 20/560). A negative pressure environment was used in 10% of cases (n = 55/530).

Fifty-two percent (n = 219/465) of COVID-19 patients who had undergone tracheostomy and were still alive had been weaned from mechanical ventilation at the point of completing the survey (Table 1). At the point of survey, 38% (n = 169/450) of patients who had undergone a tracheostomy had been discharged from intensive care. The all-cause

Table 1 Outcomes following tracheostomy in COVID-19 patients

All cause mortality following tracheostomy in COVID-19 patients n (%) [N = 530]	
Died following tracheostomy	62 (12)
Still alive at the point of survey	468 (88)
Cause of death following tracheostomy n (%) [N = 62]	
COVID-19 related	60 (97)
Tracheostomy related	2 (3)
Duration (days) from tracheostomy to death [N = 62]	
Median (IQR)	8 (5, 12)
Weaning from mechanical ventilation n (%) [N = 465]	
Successfully weaned from mechanical ventilation	244 (52)
Still ventilated at the time of completing the survey	221 (48)
Time (days) from tracheostomy to successful wean [N = 217]	
1–3 days	28 (13)
4–6 days	50 (23)
7–9 days	48 (22)
10–12 days	40 (18)
13–15 days	26 (12)
>15 days	25 (12)
Discharge from ICU n (%), [N = 450]	
Discharged from ICU at the point of survey	169 (38)
Still in ICU at the point of survey	281 (62)

in-hospital mortality following tracheostomy in COVID-19 patients was 12% (n = 62/530) with two deaths attributed to post-operative tracheostomy complications and the other 60 (97%) recorded as “COVID-19 related”. As many of the patients are yet to complete their critical care, the mortality and weaning rates are likely to change with time. The success in tracheostomy decannulation and discharge from hospital will be evaluated in future reports.

Adequate PPE should be viewed as mandatory for tracheostomy in COVID-19 patients due to the significant potential for aerosol generation^{1,2}. In all cases (n = 545/545), operators used either an FFP3 mask or Powered Air Purifying Respirator (PAPR). Additional PPE involved either a face visor or hood with face shield in 99% of cases (n = 538/545), a disposable gown in 97% (n = 527/545) and double gloves in 90% (n = 490/545). The question “Did any of the operators test positive

for COVID-19 within two weeks of the procedure”, was answered by 71% (n = 400/564) and all confirmed that no operators had become COVID-19 test positive within two weeks of the procedure. Whilst this finding is reassuring, it is open to potential reporting bias and does not account for the remaining cases that are yet to reach the two-week time point.

The number of COVID-19 PCR tests performed prior to tracheostomy ranged from 1 to 12 (median 1, IQR 1,2). The COVID-19 test was positive in 86% (n = 443/503) of patients prior to tracheostomy with the length of time from the last test to the day of surgery recorded as median 14 days (IQR 7,19). The role of identifying PCR test status in COVID-19 patients ahead of tracheostomy is unclear. ICU patients can remain test positive for several weeks after the onset of symptoms^{3,4}, and whether the detection of viral RNA by PCR predicts risk of infectivity to operators and other health care professionals

is uncertain. Delaying tracheostomy to achieve negative tests is likely to prolong endotracheal ventilation and thus defer the potential benefits of tracheostomy whilst increasing the risk of complications relating to endotracheal intubation.

Data collection

Study data were collected and managed using REDCap electronic data capture tools hosted at University College London. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources.

Funding source

COVIDTrach is supported by the UCL / Wellcome Trust COVID-19

rapid response fund. Nick Hamilton is supported by a National Institute of Health & Research (NIHR) lectureship the Academy of Medical Sciences Starter Grant and the Royal College of Surgeons (Eng). Anne GM Schilder is an NIHR Senior Investigator and Director of the NIHR UCLH BRC Hearing Theme; the research of her UCL Ear Institute evidENT team is supported by the National Institute for Health Research (BRC, ARC, CRN, PGfAR, RfPB), Wellcome Trust, RCSEng, and EU Horizon2020. Martin Birchall is an NIHR Senior Investigator. Data collection through BAOMS was managed by Fabian Puglia and supported by NFORC and Saving Faces.

DOI: 10.1002/bjs.12020

- 1 Jessop ZM, Dobbs TD, Ali SR, Combella E, Clancy R, Ibrahim N *et al.* Personal Protective Equipment (PPE) for Surgeons during COVID-19 Pandemic: A Systematic Review of

Availability, Usage, and Rationing. *Br J Surg* 2020; <https://doi.org/10.1002/bjs.11750> [Epub ahead of print].

- 2 Surgeons come together again with updated PPE COVID-19 advice, stressing PHE recommendations are minimum not maximum ENT.UK; BAOMS. <https://www.entuk.org/sites/default/files/COVID%20BAOMS%20and%20ENT%202nd%20update%20FINAL.pdf>.
- 3 Zhao J, Yuan Q, Wang H, Liu W, Liao X, Su Y *et al.* Antibody responses to SARS-CoV-2 in patients of novel coronavirus disease 2019. *Clin Infect Dis* 2020; <https://doi.org/10.1093/cid/ciaa344> [Epub ahead of print].
- 4 Zhou F, Yu T, Du R, Fan G, Liu Y, Xiang J *et al.* Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* 2020; **395**: 1054–1062.

Supporting information

Additional supporting information can be found online in the Supporting Information section at the end of the article.