Tracheotomy in COVID-19 patients: preliminary experience and technical refinements

Editor

The COVID-19 pandemic is deeply affecting the surgical landscape[1–4]. In this context, tracheotomy is considered one of the riskiest procedures[5], but our experience suggests that rational measures[6] and teamwork can significantly reduce the risk of transmission to staff. Few real-life data about tracheotomy in intubated patients with COVID-19 exist[7]. To avoid aerosolization and airflow from lower airways, we open the trachea above the endotracheal tube (ETT) cuff via an open surgical technique, following guidelines[5,8], with some technical refinements outlined here.

Ventilation is held at the end of expiration until the cuff is deflated, advanced to the level of the carina, then reinflated to minimize airflow between the tracheal wall and tube. After a horizontal 1·5–3-cm skin incision, 0·5 cm cranial to the jugular suprasternal notch, blunt dissection along the midline exposes three rings and two intercartilaginous spaces. The most cranial intercartilaginous space visible under the isthmus is weakened to verify the position of the cuff and push it further down if needed. There is no reason to transect the isthmus as described[7], especially in bedside procedures, as it is always possible to retract it cranially and tailor a sub-isthmic tracheostomy. With the ETT tube inflated and in place, a wide opening between the rings is created so that the suture of the caudal rings to the skin forms a stable tracheostomy without any damage to the cartilage or need for a Bjork flap. Exchange between the ETT and cannula is crucial, as between ETT cuff deflation and cannula cuff inflation the alveolar space is not sealed from the environment ('no-seal' time). When the surgeon is ready, the intensivist holds ventilation at the end of the expiration, clamps the tube with an extracorporeal membrane oxygenation (ECMO) clamp, disconnects the tube connecting the cannula with the inner tube already in place (no obturator is needed with the previously tailored large opening) and puts it within easy reach of the first operator. Applying the ECMO clamp leads to three small, but potentially decisive, achievements: disconnecting the ETT from the circuit without allowing airflow; connecting the circuit to the cannula in advance; and reducing alveolar de-recruitment.

The ETT cuff is deflated and pulled up, the already connected cannula is placed into the trachea under direct vision (immediately below the ascending end of the tube) and the cuff is inflated. This allowed us to reduce the no-seal time to less than 2 seconds.

The only 'surgical' problem in our series of four patients (all male, aged 67–80 years, ventilated for 12–25 days at the time of tracheostomy) was a misting of the goggles in one case, probably due to insufficient use of surfactant, a trivial issue to keep in mind and avoid. The operating time was 8–15 minutes and no complications were noted. No potential transmission has been recorded. These simple steps may be useful for others to consider to ensure staff safety under these difficult circumstances.

D. Pasero[1,3], D. Rizzo[2], A. Piras[2], L. Floris[1], C. Parrilla[4], F. Riu[2], P. Terragni[1,3] and F. Bussu[2,3]

[1]Intensive Care Unit and [2]Otolaryngology Division, Azienda Ospedaliero Universitaria Sassari, and [3]Department of Medical, Surgical and Experimental Sciences, Università di Sassari, and [4]Otolaryngology Fondazione Policlinico Universitario Agostino Gemelli, Rome, Italy

DOI: 10.1002/bjs.11757

1 COVIDSurg Collaborative. Global guidance for surgical care during the COVID-19 pandemic. *Br J Surg* 2020; https://doi.org/10.1002/bjs.11646 [Epub ahead of print].

2 Di Marzo F, Sartelli M, Cennamo R, Toccafondi G, Coccolini F, La Torre, G *et al.* Recommendations for general surgery activities in a pandemic scenario (SARS-CoV-2). *Br J Surg* 2020; https://doi.org/10.1002/bjs.11652 [Epub ahead of print].

3 Søreide K, Hallet J, Matthews JB, Schnitzbauer AA, Line PD, Lai PBS *et al.* Immediate and long-term impact of the COVID-19 pandemic on delivery of surgical services. *Br J Surg* 2020; https://doi.org/10.1002/bjs.11670 [Epub ahead of print].

4 Spinelli A, Pellino G. COVID-19 pandemic: perspectives on an unfolding crisis. *Br J Surg* 2020; https://doi.org/10.1002/bjs.11627 [Epub ahead of print].

5 Chao TN, Braslow BM, Martin ND, Chalian AA, Atkins JH, Haas AR, Rassekh CH. Tracheotomy in ventilated patients with COVID-19. Guidelines from the COVID-19 Tracheotomy Task Force, a Working Group of the Airway Safety Committee of the University of Pennsylvania Health System. *Ann Surg* 2020; https://journals.lww.com/annalsofsurgery/Documents/Tracheotomy%20in%20ventilated%20patients%20with%20COVID19.pdf [accessed 10 May 2020].

6 Ives J, Huxtable R. Surgical ethics during a pandemic: moving into the unknown? *Br J Surg* 2020; https://doi.org/10.1002/bjs.11638 [Epub ahead of print].

7 Mattioli F, Fermi M, Ghirelli M, Molteni G, Sgarbi N, Bertellini E *et al.* Tracheostomy in the COVID-19 pandemic. *Eur Arch Otorhinolaryngol* 2020; https://doi.org/10.1007/s00405-020-05982-0 [Epub ahead of print].

8 ENT UK. *Guidance for Surgical Tracheostomy and Tracheostomy Tube Change during the COVID-19 Pandemic*; 2020. https://www.entuk.org/tracheostomy-guidance-during-covid-19-pandemic [accessed 10 May 2020].