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Tracheotomy in patients COVID-19: A necessary high risk procedure. Two center experience☆

Traqueotomía en pacientes COVID-19: un procedimiento necesario de alto riesgo. Experiencia de dos centros

To the Editor,

Coronavirus disease 2019 (Covid-19) caused by SARS-CoV-2 is now a pandemic, as defined by the World Health Organization, that has caused a health emergency and social alarm (Royal Decree 463/2020, of 14 March).[1] It is an infection that is normally asymptomatic, but in 14%–20% of patients it can be complicated by pneumonia with bilateral infiltrates. Five percent of these cases may develop acute respiratory distress syndrome (ARDS), sepsis, septic shock and multiorgan failure requiring admission to an intensive care unit (ICU), orotracheal intubation, and invasive mechanical ventilation (IMV).[2,3]

SARS-CoV-2 is transmitted from person to person by the respiratory route in Flügge droplets (>5 microns) and aerosols originating from infected individuals.[4,5] This poses a threat of contagion to all healthcare personnel involved in the care of these patients, especially those responsible for patients who require ventilatory support.

Tracheotomy in ARDS patients is considered necessary after prolonged orotracheal intubation or when long, difficult weaning is anticipated.[6] Tracheostomy after 7–10 days of IMV is associated with a potential reduction in the duration of ventilation and length of ICU stay, especially in patients with severe or moderate muscle weakness, failed attempt to wean, limited respiratory reserve, and abundant thick secretions.[7]

All aspects of tracheotomy in patients affected by SARS-CoV-2 infection have been discussed extensively due to the high risk of transmission to medical personnel from aerosol generation during manipulation and opening of the airway. In this regard, various consensus documents and recommendations which must be followed during procedures have been published, addressing not only the indication but also the safety and protection of the personnel who carry out the procedure, the technique, and the ideal conditions for its implementation.[8–10]

The aim of our study was to analyze tracheotomies performed in intubated patients in the setting of SARS-CoV-2 pneumonia, and to describe the steps taken when performing these procedures, and outcomes in terms of days on ventilation, days with tracheotomy, and surgical complications.

This is a descriptive, retrospective study of intubated Covid-19 patients receiving IMV who underwent surgical tracheotomy in a third-level public hospital and a private hospital that treated patients from both the private system and the public health service during the pandemic.

Surgeries performed between March 16 and April 24, 2020, the date of the end of follow-up, were analyzed. Variables such as sex, age, intubation days, days until tracheostomy, IMV days after tracheostomy, and surgical complications were collected.

Tracheotomy was indicated in all patients and performed according to the specific recommendations of the Spanish Society of Otorhinolaryngology and Head and Neck Surgery (SEORL-CCC) for tracheotomies in patients infected with SARS-CoV-2.[11] These recommendations are summarized as follows: use of appropriate protective measures and personal protective equipment (PPE); avoidance of the use of electrical or ultrasonic cutting and coagulation systems; complete muscle relaxation of the patient throughout the procedure to prevent cough and aerosolization; adequate preoxygenation of the patient; apnea after a short period for passive expiration with open adjustable pressure-limiting valve or ventilator disconnection; tracheal incision; orotracheal tube removal; and cannulation with non-fenestrated cannula. Positioning the patient with hyperextension of the neck is required to facilitate the procedure.

A total of 27 patients underwent the procedure, 20 of whom were men (70%). The mean age of the patients was 65 (51–77) years. The median number of days from intubation to tracheostomy was 19 (7–30). Two patients died and 1 patient was weaned from the ventilator and extubated. Of the patients whose tracheostomy cannula remained in place at the end of follow-up period, 4 continue to receive mechanical ventilation, 8 are in the process of weaning, and 11 patients are spontaneously ventilated with or without oxygen therapy. Of the patients in whom IMV has been withdrawn, the median period between tracheotomy and IMV withdrawal was 3 days (1–12) with a mean of 4.7 days.

Three patients (11%) developed complications from surgery: 2 had small bleeds controlled by compression, and 1 had a cervicotomy infection requiring debridement. We did not detect complications between performing the tracheotomy and the end of follow-up period. In 4 cases, the cannula had to be changed for a longer or wider tube due to ventilation difficulties (air leakage or need for very high ventilation pressures).

None of the surgeons who performed the interventions developed symptoms of SARS-CoV-2 infection.

To summarize, in our experience, tracheostomy in patients with SARS-CoV-2 infection can provide potential benefits in terms of airway management, reduction of days of IMV and ICU stay, with a low percentage of complications related to surgery. In our series, the median number of days until tracheotomy exceeds the recommended 7 days. This is due to the lack of consensus on the appropriate moment to perform this intervention, which compelled us to follow the guidelines of our critical units that recommend tracheotomy between the second and third weeks of intubation. Randomized studies are required to ensure that early tracheotomy substantially improves the benefits cited above.

Tracheotomy is a high-risk procedure for medical personnel, but the risk can be dramatically reduced by strictly complying with the protective measures and technical recommendations described. In our experience, it can be safely performed by limiting or completely avoiding the use of electrical or ultrasonic cutting and coagulation systems.

Conflict of interests

The authors state that they have no conflict of interests.

References

1. Sohrabi C, Alsafi Z, O'Neill N, Khan M, Kerwan A, Al-Jabir A, et al. World Health Organization declares global emergency: a review of the 2019 novel coronavirus (COVID19). Int J Surg. 2020;76:71–6, http://dx.doi.org/10.1016/j.ijsu.2020.02.034.
2. Cinesi Gómez C, Peñuelas Rodríguez Ó, Luján Torné ML, Egea Santaolalla C, Masa Jiménez JF, García Fernández J, et al. Clinical consensus recommendations regarding non-invasive respiratory support in the adult patient with acute respiratory failure secondary tor SARS-CoV-2 infection. Rev Esp Anestesiol Reanim. 2020;16:261–70, http://dx.doi.org/10.1016/j.redar.2020.03.006.
3. Tsang KW, Ho PL, Ooi GC, Yee WK, Wang T, Chang-Yeun M, et al. A cluster of cases of severe acute respiratory syndrome in Hong Kong. N Engl J Med. 2003;348:1977–85, http://dx.doi.org/10.1056/NEJMoa030666.
4. Cordovilla Perez R, Álvarez S, Llanos L, Nuñez Ares A, Cases Viedma E, Días-Pérez D, et al. Recomendaciones de Consenso SEPAR y AEER sobre el uso de la broncoscopia y la toma de muestras de la vía respiratoria en pacientes con

☆ Please cite this article as: Martínez-Téllez E, Orús Dotú C, Trujillo-Reyes JC, Guarino M, Cladellas Gutiérrez E, Planas Cánovas G, et al. Traqueotomía en pacientes COVID-19: un procedimiento necesario de alto riesgo. Experiencia de dos centros. Arch Bronconeumol. 2020;56:673–674.

sospecha o con infección confirmada por COVID-19. Arch Bronconeumología. 2020;56:19–26, http://dx.doi.org/10.1016/j.arbres.2020.03.017.
5. Lewis D. Is the coronavirus airborne? Experts can't agree. Nature. 2020;580:175, http://dx.doi.org/10.1038/d41586-020-00974-w.
6. Wei WI, Tuen HH, Ng RWM, Lam LK. Safe tracheostomy for patients with severe acute respiratory syndrome. Laryngoscope. 2003;113:1777–9, http://dx.doi.org/10.1097/00005537-200310000-00022.
7. Adly A, Youssef TA, El-Begermy MM, Younis HM. Timing of tracheostomy in patients with prolonged endotracheal intubation: a systematic review. Eur Arch Otorhinolaryngol. 2018;275:679–90, http://dx.doi.org/10.1007/s00405-017-4838-7.
8. Chao TN, Braslow BM, Martin ND, Chalian AA, Atkins JH, H:aas AR, et al. 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 Annals of Surgery. Ann Surg. 2020;272:30–2.
9. Crossley J, Clarck C, Brody F, Maxwell JH. Surgical considerations for an awake tracheotomy during the COVID-19 pandemic. J Laparoendosc Adv Surg Tech A. 2020;30:477–80, http://dx.doi.org/10.1089/lap.2020.0239.
10. Michetti CP, Burlew CC, Bulger EM, Davis KA, Spain DA. Performing tracheostomy during the Covid-19 pandemic: guidance and recommendations from the Critical Care and Acute Care Surgery Committees of the American Association for the Surgery of Trauma. Trauma Surg Acute Care Open. 2020:5, http://dx.doi.org/10.1136/tsaco-2020-000482.
11. Díaz de Cerio Canduela P, Perepérez Ferrandis FE, Parente Arias P, López Álvarez F, Sistiaga Suarez J. Recomendaciones de la Sociedad Española de Otorrinolaringología y Cirugía de Cabeza y Cuello para la realización de traqueotomías en relación con pacientes infectados por coronavirus COVID-19. Acta Otorrinolaringol Esp. 2020;71:253–5, http://dx.doi.org/10.1016/j.otorri.2020.03.001.

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https://doi.org/10.1016/j.arbr.2020.05.007

COVID-19: Thoracic Diagnostic Interventional Procedures in Troubled Times☆

COVID-19: intervencionismo diagnóstico torácico en tiempos difíciles

To the Editor:

SARS-CoV-2 disease (Covid-19) is an infection caused by a new emerging coronavirus first detected in Wuhan, China, in December 2019. It has now become a pandemic and is posing a serious public health problem for almost all countries.[1] In particular, the incidental diagnosis of thoracic tumors in patients with SARS-CoV-2 infection represents an additional challenge, both from a diagnostic and therapeutic point of view. Some publications have addressed the clinical management of cancer patients in the current SARS-CoV-2 pandemic, but there are no specific guidelines for performing thoracic diagnostic interventional procedures in patients with tumors who are also infected with SARS-CoV-2.[2–12] We report two cases in which thoracic tumors were detected that required biopsy with radiological control at the peak of the Covid-19 pandemic that hit Madrid in the second half of March 2020.

These were 2 patients (a 19-year-old woman with no history of interest, and a 73-year-old man, former smoker) who came to our hospital with chest symptoms (fever, cough, and dyspnea) in the second half of March 2020, coinciding with the peak of the Covid-19 pandemic that struck Spain and, in particular, the Madrid region. Both patients underwent polymerase chain reaction (PCR) testing for SARS-CoV-2 and a chest X-ray in the emergency department. In both cases PCR was positive and chest X-ray showed opacities of infectious appearance and a tumor mass. Treatment for SARS-CoV-2 infection was started in both patients (with good clinical progress) and a CT scan of the chest was performed, confirming the tumor lesions. The 19-year-old patient had a voluminous mass in the right hemitorax with destruction of the third costal arch and invasion of the chest wall and spinal canal. Ipsilateral pleural implants of metastatic appearance and some ground glass opacities of an infectious nature were also observed in the right lung base (Fig. 1A–D). The 73-year-old patient had a 6 cm mass in the upper right lobe, adenopathies in the ipsilateral pulmonary hilum, and bilateral opacities of pneumonic appearance (Fig. 1E–G). In this second case, no signs of distant metastases were observed. During the fortnight in which the two patients were admitted (March 16–31, 2020), the region of Madrid endured the highest number of cases and deaths from this pandemic in the whole country, and our center, a university hospital in Madrid with about 850 beds, had virtually become a "Covid-19 dedicated" center, with more than 950 patients admitted with SARS-CoV-2 infection. Because of this situation, most of the hospital's clinical activity (like many other centers throughout the country) was focused on the treatment of Covid-19 patients, and large numbers of medical personnel (including pulmonologists, medical oncologists and radiation therapists, thoracic surgeons, pathologists, and radiologists) had been recruited from different departments of the center for the care and management of these patients. As a result of this unusual situation, most of the hospital's "ordinary" clinical activity was suspended, including the routine care of cancer patients (consultations, day hospital, radiotherapy sessions, follow-up radiological studies). However, in the case of our 2 patients, we decided to perform a CT-guided biopsy of the lesions in the hope of obtaining an early histological diagnosis and being able to start specific treatment as soon as possible. Because both patients had Covid-19, the biopsy procedure was performed on the CT equipment of our hospital reserved for patients with this infection. During the procedure, the infection control protocol of the radiodiagnostics department was followed and personal protective equipment (PPE) was used. Both patients wore masks, while radiology staff who participated in the biopsy procedure followed our hospital's Covid-19 control protocol and used PPE, since core needle biopsy is considered a potentially aerosol-generating procedure.[13] PPE included

☆ Please cite this article as: Gorospe L, Ayala-Carbonero AM, Ureña-Vacas A, Medina-Díaz M, Arrieta P, Mirambeaux-Villalona RM, et al. COVID-19: intervencionismo diagnóstico torácico en tiempos difíciles. Arch Bronconeumol. 2020;56:674–676.