Technical aspects of one-lung ventilation (OLV) in a patient affected by viral pneumonia Sars-Cov-2 related

Sir,

The pandemic of Sars-Cov-2 has exposed the meaning to take proper and effective protective measures to avoid infection among health care workers. Therefore, it's crucial to maintain a high level of attention during airway manipulation for anesthesiologists, and our experience here described could be beneficial to the global community in the battle against COVID-19 infection. We would present the management of one-lung ventilation (OLV) in a patient with a confirmed Sars-Cov-2 infection complicated by viral pneumonia and pleural empyema. Several authors recommend some maneuvers for managing OLV in all patients undergoing thoracic surgery[1,2] during the pandemic era. For thoracic surgery, we developed a successful approach, according to recent literature[3,4] that has been proved to be simple and effective during OLV in a patient with a confirmed case of COVID-19 pneumonia. A 77-year-old man, 25 BMI kg/m^2, American Society of Anesthesiologists score III with a history of arterial hypertension, underwent a video-assisted thoracoscopic surgery (VATS) and subsequent toilet of pleural empyema. The patient was affected by infection of Sars-Cov-2 characterized by a nasopharyngeal test for COVID-19 and respiratory failure necessitating oxygen supplementation through a non-rebreather mask [Figure 1]. All medical staff involved followed recommendations against COVID-19 infection and used all personal protective equipment such as wearing disposable protective clothing, medical-grade masks N95, disposable surgical caps, medical goggles, disposable gloves and shoe covers. In this scenario, we completed a rapid sequence induction with a video laryngoscopy (McGrath® MAC Portable Video Laryngoscope – Medtronic, Minneapolis, US), and we inserted a double-lumen tube (DLT) 41 French (Shiley™ Endobronchial tube, left – Covidien LLC, Mansfield, US) using a blind insertion technique. We proceed with correct positioning check through chest auscultation and ventilator parameters modifications, in particular, checking peak-inspiratory pressure increase due to one-lung ventilation. As a further check, we proceeded to perform focused thoracic sonography checking for pleural sliding bilaterally to confirm pulmonary isolation.[5] The absence of pleural sliding and lung pulse on the side of the collapsed lung was a further confirmation of the correct pulmonary isolation. These controls were performed both in supine and lateral decubitus. We followed the Italian Society of Anaesthesia Analgesia and Intensive Care recommendations about airway management in COVID-19 patients.[6]

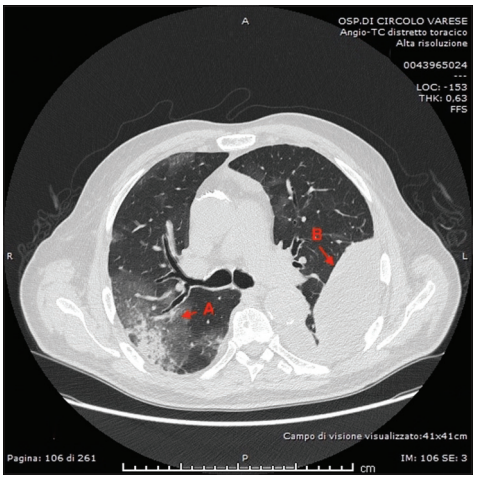

Figure 1: Chest CT image: (a) lung involvement with crazy-paving pattern and consolidations surrounded by ground-glass opacities, typical of the COVID-19 pneumonia. (b) large pleural-thoracic empyema

Before skin incision, we proceed to clamp the bronchial lumen between the ventilator circuit and the DLT connection to occlude ventilation to the left lung. We previously placed at the entrance of the nonventilated tube (bronchial side) a HEPA filter (DAR™ Mechanical Filter – Covidien LLC, Mansfield, US). After that, we disconnected the bronchial lumen of DLT from the breathing circuit to permit a complete lung deflation [Figure 2]. The duration of one-lung ventilation was twenty minutes, and surgeons completed the operation through one port access. The operation was completed uneventfully, and during OLV, the oxygenation and the ventilation parameters remained appropriate. The patient was then transferred to the intensive care unit. A similar technique has been described[3], and we appreciate these findings despite the recommendations endorsed by the Cardiothoracic Society of Anaesthesia in Great Britain and Ireland.[1] The double-lumen tube placement can be performed with an effective and safe blind technique reducing the risk of aerosol in these procedures. For these reasons, in our opinion, the fiberoptic technique is not recommendable in a protective setting because of the risk of aerosolization can increase the infection rate between

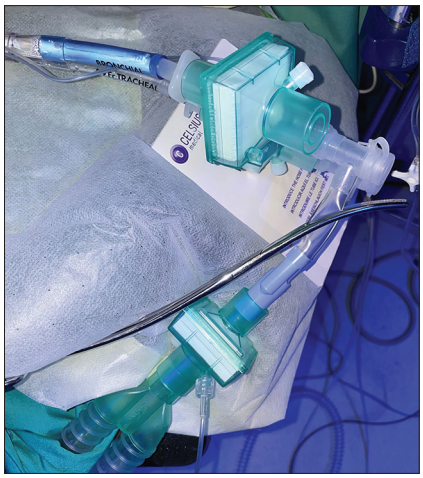

Figure 2: Ventilator circuit with the bronchial lumen of DLT disconnected during OLV with the HEPA filter at its extremity

healthcare workers. Additionally, HEPA filter positioning is strongly recommendable during ventilation according to manufacturer standards. There is a critical ranging window of particle size in which the filter is effective and efficient and luckily, viruses are not able to move from an infected patient to a healthy individual without a vector-like respiratory particle. The World Health Organization declared that the main mechanism of Sars-Cov-2 infection is human–human transmission through droplets across a spectrum of sizes. Therefore, the virus and other types of particles (aqueous) merger permit to HEPA filter to block the infectious particles trapping them into the unit. Our experience is limited to a single patient affected by Sars-Cov-2 viral pneumonia that necessitated OLV, and it has proven practical, effective and efficient. In conclusion, our technical approach could be a support to all clinicians in front of the COVID-19 pandemic.

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Conflicts of interest
There are no conflicts of interest.

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References

1. Thornton M, Reid D, Shelley B, Steven M. Management of the airway and lung isolation for thoracic surgery during the COVID-19 pandemic: A reply. Anaesthesia 2020;75:1548-9.
2. Tryphonopoulos P, McFaul C, Gagne S, Moffett S, Byford L, Thompson C. COVID-19 and one-lung ventilation. Anesth Analg 2020;131:e90-1.
3. Kostroglou A, Alevizou A, Sidiropoulou T. One-lung ventilation: A simple technique to reduce air contamination during the coronavirus disease 2019 (COVID-19) pandemic. J Cardiothorac Vasc Anesth 2020;34:2856-9.
4. Ponnaiah V, Bailey CR. One-lung ventilation during the COVID-19 pandemic. Anaesthesia 2020;75:1546-7.
5. Parab SY, Kumar P, Divatia JV, Sharma K. A prospective randomized controlled double-blind study comparing auscultation and lung ultrasonography in the assessment of double lumen tube position in elective thoracic surgeries involving one lung ventilation at a tertiary care cancer institute. Korean J Anesthesiol 2019;72:24-31.
6. Sorbello M, El-Boghdadly K, Di Giacinto I, Cataldo R, Esposito C, Falcetta S, *et al*. The Italian coronavirus disease 2019 outbreak: Recommendations from clinical practice. Anaesthesia 2020;75:724-32.

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