Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Fig. 4. The HEPA filter connected into the bronchial adapter before the Y connector.

Conflict of Interest

None.

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Sometimes Less Is Worse: A Recommendation Against Nonintubated Video-Assisted Thoracoscopy During the COVID-19 Pandemic

To the Editor:

In late 2019, a new virus, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged in Wuhan, China, causing a severe flu-like illness named coronavirus disease 2019 (COVID-19).[1] The new virus has spread rapidly all over the world, and the World Health Organization declared it

a pandemic on March 11, 2020.[2] COVID-19 causes a severe respiratory illness in 10% to 15% of patients, with an overall mortality rate as high as 12%.[3]

The virus is transmitted from person to person through droplets and contact routes. In the operating room, several procedures such as face mask ventilation, intubation, bronchoscopy, extubation, and in general all the aerosol-generating practices put healthcare providers at risk for transmission of the infection.

The impact of the COVID-19 outbreak on elective surgery is high and comprises several aspects, including the overall decrease of surgical activity and the subsequent need for prioritization of procedures, healthcare workers' safety, optimization of resources, and the screening of patients for COVID-19 positivity.

Unlike other surgeries, thoracic oncologic surgery cannot be delayed for many patients to avoid catastrophic consequences on their prognosis. In the context of lung surgery, nonintubated video-assisted thoracoscopy (NIVATS) has grown in popularity in recent years.[4] NIVATS is suitable for diagnostic procedures or resective surgery as well.[4] There is no consensus on the best anesthetic care for NIVATS. Basically, it is performed avoiding intubation and using monitored anesthesia care combining sedatives, low-dose opioids, and loco-regional techniques.[4–6] Given the importance of airway management during NIVATS, we advise against this kind of technique in light of the COVID-19 outbreak.

Some general considerations apply to thoracic surgery, especially to NIVATS, as well as to other surgeries in this pandemic emergency. First, anesthesiologists and surgeons must consider the priority of surgery. For instance, diagnostic procedure for benign tumor or chronic disease should be postponed whenever possible in favor of malignant tumor resection surgeries. Many NIVATS procedures belong to the first group of procedures and can be delayed. Second, all patients should be screened for COVID-19 positivity to avoid subjecting patients with the virus to surgery. This represents a risk for the patients themselves and for the staff of the operating room. Despite these reasonable considerations, there is no consensus on the best pathway for patients scheduled for elective surgery. Subjecting all patients to a swab test is costly both in terms of resources and organization. Moreover, the test can be false negative in about 30% of patients. Thus, a negative result does not rule out COVID-19 and should not be used as the sole basis for treatment or patient management decisions.[7] If patients affected by the COVID-19 infection, even those who are asymptomatic, should not undergo elective surgery during the pandemic, all patients must be considered and managed as potentially infected to prevent virus diffusion. The best strategy for routine management of patients during this pandemic is beyond the scope of this manuscript, and the use of personal protective equipment should be based on national protocols.

In addition, NIVATS deserves specific considerations. To perform nonintubated thoracic procedures safely, the main goal is to avoid airway obstruction during sedation and the detrimental effect of chest opening or surgical manipulation. Most NIVATS cases are managed under light sedation with oxygen supply via nasal cannula or face mask.[4,6] Conversely, some anesthesiologists perform deeper sedation using a supraglottic airway device.[6]

The risk for virus diffusion through aerosol and droplets must be considered high even during uneventful nonintubated procedures. This can be enhanced by oxygen delivery and, especially, by coughing, which is one of the main issues during NIVATS, usually at chest opening and during surgical manipulation. The risk for intraoperative intubation is another important question. Even if uncommon, anesthesiologists must always be prepared for urgent intubation during NIVATS.[6] The use of a videolaryngoscope is advisable in such circumstances, but the maneuver can be challenging because the patient is usually in a lateral position.[4,6] Furthermore, the need for double-lumen tube or bronchial blocker positioning to manage 1-lung ventilation makes the maneuver more complex and laborious. As a consequence, urgent intubation can increase the exposure of the surgical staff to droplet spread and aerosolization during facial mask ventilation, intubation, and bronchoscopy. Indeed, the importance of targeting a fast and easy intubation in diagnosed or suspected COVID patients is recommended by several scientific societies.[8–11]

Furthermore, the current lack of strength of evidence supporting the advantage of NIVATS compared with standard thoracotomy or VATS procedures must be kept in mind before deciding to perform thoracic surgery without intubation.[12–14] Thus, considering that airway management for thoracic surgery includes more aerosol-generating procedures than other surgeries (ie, intubation, bronchoscopy for double-lumen tube or bronchial blocker positioning, airway suction, or tube disconnection), we believe that procedures not yet completely based on evidence of effectiveness should be limited as much as possible during the COVID-19 pandemic.

Conflict of interest

The authors do not have any conflicts of interest to declare.

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The Use of Point-of-Care Lung Ultrasound and Echocardiography in the Management of Coronavirus Disease 2019 (COVID-19)

To the Editor:

Over the past few months, coronavirus disease 2019 (COVID-19) has provided an unprecedented challenge to critical care teams across the world. As the number of cases increases exponentially, we are seeing an unparalleled strain on intensive care resources.

To ensure optimal patient care, rapid, reliable, and low-risk diagnostic imaging is required. Although computed tomography can aid with diagnosis, the volume of critically unwell and highly infective patients means mass computed tomography scanning is unlikely to be a safe or practical approach. The critical care community thus has acknowledged the importance of point-of-care ultrasonography (POCUS) in the management of COVID-19, specifically lung ultrasound (US) and transthoracic echocardiography.

Current reports of lung US findings secondary to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection appear to demonstrate a correlation to disease stage and phenotype (Fig 1). Italian intensivist Gio Volpicelli also described its sensitivity in identifying COVID-19, even in patients for whom reverse transcription polymerase chain reaction swabs returned negative (personal communication, April 2020). The precise protocol for lung POCUS still is debated, with the current UK Intensive Care Society guidelines suggesting a 6-view approach (apical, baso-anterior, and posterior-lateral views bilaterally) and providing advice regarding probe decontamination.[1,2]

In early disease, initial findings include the presence of focal B-lines interspersed with areas of healthy lung and A-lines.[1] An irregular and thickened pleura with subpleural consolidation also may be seen.[3] If there is no oxygen requirement, these patients may be suitable for discharge.[2]

In moderate disease, an increased number of confluent B-lines may be visible, with loss of A-lines (video 1). Such patients are likely to require supplementary oxygen and admission. These patients may fit the L phenotype and require moderate positive end-expiratory pressure ventilation strategies with conservative fluid balance.[2-4]

As the disease progresses, lobar and translobar consolidation may be seen, with the possibility of associated pleural effusions (large effusions are rare and a poor prognostic indicator) (video 2). These patients are likely to require critical care admission and appear to fit the H phenotype, with high positive end-expiratory pressure, early proning, and conservative fluid strategies possibly beneficial.[2-4] The dynamic nature of this disease does, however, mean we need to remain malleable with the aforementioned described patterns and our treatment strategies.

When considering echocardiographic findings in COVID-19, numerous mechanisms of cardiac injury have been described (Fig 2). These include myocarditis, global cardiac dysfunction, right ventricular failure, and acute myocardial infarction (AMI) (video 4). The European Society of Cardiology guidance on COVID-19 echocardiography advises only patients with cardiovascular compromise should be scanned, and these scans should be focused in nature (Table 1).[5]

Myocarditis may occur secondary to the abundance of angiotensin-converting enzyme 2 receptors on cardiac myocytes—the binding site for SARS-CoV2—with echocardiographic findings described in myocarditis including: (1) global or regional left ventricular dysfunction (possibly resulting in misdiagnosis as AMI), (2) right ventricular dysfunction, (3) apparent left ventricular hypertrophy (secondary to interstitial edema), and (4) ventricular thrombi.[6]

Right ventricular failure may be present as a result of raised pulmonary pressures (secondary to associated lung pathology, high ventilatory pressures, or pulmonary thrombi), myocarditis, or systemic hyperinflammation. Echocardiographic findings include right ventricular dilation with impaired systolic function (video 3).

Global ventricular dysfunction and Takotsubo cardiomyopathy also have been observed, presenting with a similar picture to that seen in septic cardiomyopathy (video 5). This is possibly a consequence of the hyperinflammatory stage of COVID-19 and is likely reversible.[5,7]