



Clinical Opinion

Is laparoscopic surgery safe during the COVID-19 Pandemic?

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Severe acute respiratory syndrome coronavirus 2 (SARS-COV2) is the RNA virus responsible for the current COVID-19 (Coronavirus Disease 2019) pandemic. It is a long single stranded RNA (30kb in length), surrounded by a lipid bilayer that is composed of three proteins: E (envelope), M (membrane), and S(spike) proteins. SARS-CoV-2 uses heavily glycosylated, extended spike protein to mediate initial cellular engagement and begin the process of infection [1]. Once the host cell is penetrated, its RNA is released, to replicate copies of itself. The virions produced burst out of the host cell and spread to other cells where the process is repeated. The clinical presentation ranges from mild respiratory symptoms in 80% of cases to severe pneumonia progressing to respiratory and multi-organ failures in 5% of cases [2]. The virus may be aerosolized and transmitted in smaller droplets in a gas suspension [3]. Phan et al stated that one of the modes of transmission of SARS-CoV-2 is through respiratory droplets or aerosols from an infected person, which can penetrate the lungs via inhalation through the nose or mouth [4]. Some articles have described a chimney effect which causes a jet of air to be blown through the laparoscopic trocars, exposing personnel in the operating room to a high concentration of infected virus particles [5]. This theoretical risk of transmission of the virus to health care workers during aerosol generating procedures like Laparoscopic surgery [1,5] has led the Royal College of Surgeons of England issuing guidance to seek alternatives to laparoscopic surgery due to the increased risk of infection with SARS-Cov-2 during laparoscopy. Although previous studies have shown that laparoscopy can lead to aerosolization of blood borne viruses [7] like hepatitis B or HIV, there is no documented evidence of an increased risk of transmission with laparoscopic surgery of these blood borne viruses which have been around for decades [3]. The precursors to the COVID-19 virus, SARS and Middle East Respiratory Syndrome (MERS-CoV), have not demonstrated evidence of disease transmission during laparoscopic surgery [8], which further lends support to the argument against abandoning laparoscopy during this pandemic. Another point in favor of not abandoning laparoscopy is that the closed surgical site offered by laparoscopy compared to laparotomy, lowers the risk of contamination with infected liquid. Additionally, there is no strong evidence that the virions are viable or are actually transmitted during laparoscopy [9].

Despite the lack of strong evidence pointing to the transmission of the virus during laparoscopic surgery, the theoretical risk of this happening warrants an approach to mitigate this. These mitigating steps have been articulated jointly by The Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) and The European Association for Endoscopic Surgeons (EAES) [6]. These include wearing full personal protective equipment (PPE) for all laparoscopic cases, reduced CO2 insufflation pressure, minimising intracorporeal electrocautery use, minimising port incisions to create a snug fit for the ports, using a closed smoke evacuation/filtration system and evacuating the pneumoperitoneum via a filtration system at the end of the procedure before removing tissue specimens or ports.

In summary there is a theoretical risk that laparoscopy, being an aerosol generating procedure, poses an increased risk of COVID-19 transmission. However, the evidence to support this theory in practice is lacking, therefore laparoscopic surgery can safely proceed provided precautionary steps as outlined by SAGES are adopted.

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