

We read in detail the comments regarding our article “A Low Cost, Safe and Effective Method for Smoke Evacuation in Laparoscopic Surgery for Suspected Coronavirus Patients”.

We thank the authors for the opportunity to insist on what ***we wrote and hammer the nail even harder than before!***

The authors state that “To date there is no evidence that COVID-19 is present in smoke generated during laparoscopic procedures from patients having proven COVID-19 infection”. This is exactly what was said in the following sentence “Although the COVID-19 virus (SARS-CoV-2) has not yet been detected in AGPs... » and the message we want to send. We agree with the comment that there is no proof to the fear in the sentence “it is feared that the Covid-19 virus could also be disseminated during AGPs and potentially infect the surgical staff.” While we regret we need not put a reference to the sentence to indicate that it is not us, the authors of the filter paper that make this statement, we also regret that the use of modal verb “could” was not clear enough to be understood. That this sentence was interpreted as “hype” is to be put to the learned societies who raised the fear, not us.

They go on to state that the SARS-Cov2 is not a blood borne virus and therefore there is no risk of the virus being in aerosol and surgical smoke. To support their declaration, they quote a statement by the American Association of Blood Banks (AABB) (1). This statement however, was intended for the public blood donors to dispel any fears about donating blood as the process of blood donation has no risk of contagion from the coronavirus.

It was also stated that respiratory viruses are generally not known to be transmitted by donation or transfusion, and that there were no reports of cases of transfusion-transmitted COVID-19 to date. This statement does not determine that the SARS-Cov2 is not present in blood, but rather that there have not yet been any reports of transmission of infection from blood donation. Of note, reports exist attesting to RNA of SARS-Cov2 being detected in the blood of six COVID19 positive patients (2). All of these patients progressed to severe symptom stage, indicating a strong correlation of serum viral RNA with the disease severity.

Next, the authors seem to completely disregard the potential aerosolization of the coronavirus from gastrointestinal content. Xiao *et al.* reported that the SARS-Cov2 was found in stools of more than 50% of COVID19 positive patients (3). Likewise, rtPCR test were highly positive for SARS-Cov2 in the peritoneal fluid of a COVID19 positive patient operated for small bowel obstruction with intact bowel at the time of operation (4) and SARS-Cov2 detected in the dialysate of a COVID19 positive patient treated with peritoneal dialysis for end stage renal disease (5). These findings imply that gastrointestinal operations involving bowel resections or perforation of viscus (or inadvertent iatrogenic injuries) where GI content may spill into the peritoneal cavity, or even just bowel obstruction as in the case above, potentially increase the risk of SARS-Cov2 in surgical smoke.

Next, the authors argue that the filters proposed for use in our article were not validated specifically for COVID19, and therefore it was not scientifically proven to filter the coronavirus.

Indeed, there were no specific tests for this virus, however according to ISO 29463-1:2017, standardized testing of filtering performance is not performed on specific viruses or bacteria but on particles with known sizes which serve as reference to the size of the necessary filtering capability (6). The filters used for ventilation machines are Ultra Low Particulate Air (ULPA) filters with the capability of removing from the air at least 99.999% of any airborne particles with a minimum particle penetration size of 0.1  $\mu\text{m}$ . According to the Centers for Disease Control, electrostatic filters have the highest filtration efficiency using electrostatically enhanced fibers to attract and retain particles (7). Manufacturers have published that these filters were challenged with a viral test protocol of  $\phi$ 174 bacteriophage with a size of 27 nm. As the SARS-Cov2 is larger (70-90 nm) the same filtering efficiency can be expected. The authors also challenge the dynamics of filtration capacity due to the different pressures involved in ventilation and pneumoperitoneum.

The authors then comment that our paper is not based on facts, but rather on suppositions, and that these create fear where there should be none. This is true, because there are indeed no facts that aerosol contains or could contain the virus and we share the authors belief that infectivity from SARS-Cov2 is far from being proven. Having said that, while evidence continues to accumulate, we should not “bury our head in the sand” and it is prudent to take the necessary precautions to ensure the safety of the operating team.

The fear of infectivity, once again, is not our doing, but that of the learned societies who published guidance and recommendations to avoid laparoscopy in the COVID crisis. As experienced MIS surgeons we promoted the use of filters in order to overcome this fear, suggesting a low cost option for hospitals struggling with resources during this pandemic. Using filters for smoke evacuation is in line with the recommendations and guidelines published by surgical societies during this pandemic outbreak. The sense of urgency prevented us from a true clinical controlled study which would take several months, and until this is available taking necessary precautions are wise.

Finally, we would like to thank the authors once again for the opportunity to hit the nail harder than before.

## References

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