

An alternative way to evacuate a pneumoperitoneum in COVID-19 suspected or positive patients.

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Abstract

Laparoscopy has been found to result in aerosolization of blood borne viruses and so a more cautious approach has been taken during the pandemic and more attention given to safe deflation of the pneumoperitoneum. We have used a heat and moisture exchange filter to deflate the abdomen as an alternative to a smoke evacuation device. These filters are known to reduce the transmission of microbes and other particulate matter in breathing systems and are readily available in the anaesthetic room.

An alternative way to evacuate a pneumoperitoneum in COVID-19 suspected or positive patients

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Abstract

Laparoscopy has been found to result in aerosolization of blood borne viruses and so a more cautious approach has been taken during the pandemic and more attention given to safe deflation of the pneumoperitoneum. We have used a heat and moisture exchange filter to deflate the abdomen as an alternative to a smoke evacuation device. These filters are known to reduce the transmission of microbes and other particulate matter in breathing systems and are readily available in the anaesthetic room.

Over the last two months clinicians have had to reconsider every aspect of our practice to identify clinical events and procedures which could expose staff and patients to increased risk of contracting COVID-19. For the foreseeable future, we will be compelled to adapt the way we work due to the risks presented by this virus.

A joint statement from the RCOG and BSGE (1) in March 2020 advised on how to minimise the potential risk of virus transmission during minimal access surgery. Though most Trusts across the UK are now performing COVID-19 testing on all patients admitted for elective surgery, this will not be possible in all cases and also a false negative rate as high as 30% is quoted (2). Therefore, as well as emergency surgery on known positive patient, the transmission risks must be considered in all cases.

The COVID-19 virus has been detected in non-respiratory specimens in infected individuals, including stool, blood, and ocular secretions, with the highest levels detected in stool. Currently, the potential for transmission via these fluids is uncertain. The well recognised benefits of laparoscopy over open surgery, including shorter hospital stays and speedier recovery, are particularly desirable in the current climate. However previous research has revealed that laparoscopy can lead to aerosolization of blood borne viruses in surgical smoke (3). Therefore it has been extrapolated that laparoscopic gas could also be contaminated with Coronavirus from infected blood, stool or peritoneal fluid. Due to this theoretical risk, laparoscopies with higher risk of bowel involvement have been deferred where possible, or if urgent, performed by laparotomy.

The splattering of blood from port sites is avoided by careful insertion and removal of specimens and trocars.

Smoke extraction devices and vacuum suction units have been provided to enable enclosed release of gas from the abdomen, permitting laparoscopic procedures to continue safely. However we have found that staff have been unfamiliar with this equipment and have failed to use them effectively, either resulting in incomplete evacuation of the pneumoperitoneum or leakage into the environment. Another method trialled in the hospital involves evacuating the pneumoperitoneum by expelling the gas via tubing attached to a port directly into a bowl of betadine. This may minimise the explosive dispersion into the air that frequently occurs, but whether virus could be released at the surface of the fluid is unknown and it did not seem a convincing method for long term use.

In the light of these unsatisfactory methods, a novel suggestion is proposed here, using a standard Heat and Moisture Exchanger (HME) filter as pictured below; these filters reduce the transmission of microbes and other particulate matter in breathing systems with 99.99% effectiveness according to their manufacturers (3) and are included in the Difficult Airway Society Consensus guidelines for managing the airway in patients with COVID-19 (5)

The HME filter is simply attached to the end of the gas tubing (previously inserted onto the gas delivery system on the stack), once the gas intake channel on the port has been closed. An adapter is required to allow the filter to fit the gas tubing and for this a size 6 endotracheal tube connector was utilised (see figure 1). Once the gas channel on the port is opened, the pneumoperitoneum deflates quickly and fully through the filter which can then be disposed of like any other contaminated waste

Though it will be difficult to acquire a solid evidence base, for just a few pounds this simple and rapid method may be one that has the potential to lower infection risk further for staff working in operating theatres during laparoscopic procedures.

We warmly invite comments from readers.

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Figure1

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