




Modifications Made for Minimally Invasive Gynecologic Oncology Surgery During the COVID-19 Pandemic Period

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Abstract

The COVID-19 pandemic is threatening the world and our country today. Minimally invasive surgery was initially thought to have a higher risk of spreading the disease through aerosolisation of viral particles through the pneumoperitoneum. This article outlines the various protective measures taken for minimally invasive surgery to decrease the aerosol spread at a Gynecologic Oncology unit during the COVID pandemic period. Precautions taken during anesthesia, trocar insertion, surgery and special precautions for smoke evacuation with viral filters are outlined.

Keywords Minimally invasive surgery · COVID-19 · Gynecological Oncology · Aerosol · Viral filter · Ultra-low particulate air filtration systems

The COVID-19 pandemic is threatening the world and our country today. Presently, India is in a Nation-wide Lock-down to flatten the curve of the disease and bring down the affected numbers. At present, there are 2,585,358 cases around the world with 179,854 deaths [1]. India has seen 20,544 cases and 653 deaths when this article was written [2]. Till now, there are no pharmacologic treatment strategies proven to be effective for COVID-19 [3].

During these testing times also, treatment of cancer must continue as it is another life-threatening disease and not taking timely action can adversely affect the survival of the patient. SARS-COV-2 is shown to have potential for aerosol transmission with potential to remain in aerosols for 3 h or

more [4]. Minimally invasive surgery was initially thought to have a higher risk of spreading the disease through aerosolisation of viral particles through the pneumoperitoneum. Minimally invasive surgery has the advantage of reducing patients stay in the hospital and freeing up the much needed hospital bed in addition to reducing the chance of a hospital-acquired infection for the patient. Now, many major surgical societies have come up with guidelines endorsing minimally invasive surgery and safe practices during minimally invasive surgery to reduce disease transmission [5–7].

This article outlines the various protective measures taken for minimally invasive surgery to decrease the aerosol spread at a Gynecologic Oncology unit during the COVID pandemic period.

Biggest concern for minimally invasive surgery was the risk of aerosol generation due to carbon dioxide pneumoperitoneum.

Steps taken to address this were:

1. Primary trocar insertion—Open or Hassen's technique was not used for abdominal entry as it can result in leakage of CO₂ into the operating room during surgery. In case open technique is used, balloon trocars must be used to ensure complete seal. We used optical trocar under camera vision for entry.
2. Secondary trocar placement—it is important to ensure that the skin incision for trocar placement should be of the correct size, as larger incisions can result in CO₂

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leakage and also slipping of the trocar. Incisions for secondary trocars were made after marking the cannula diameter on the skin so that the cannula fits tightly and there is no leakage of CO₂ through the insertion site.

3. Operating at a lower pneumoperitoneum setting of 10–12 mm Hg.
4. Cautery settings were set at the lowest possible level (ERBE system monopolar setting at 2 and bipolar setting at 3) to reduce the smoke. When cautery was used, long desiccation times were avoided. The infundibulopelvic and uterine pedicles were reinforced with a surgical clip to ensure haemostasis and decrease desiccation time.
5. Closed passive smoke evacuation system was used to evacuate the smoke. We did not have access to active suction machines with inbuilt ultra-low particulate air filtration systems hence a modification was made as suggested by the technology committee of European association of endoscopic surgery using a viral filter used in ventilators [8]. Viral filter used for ventilation machines with 99.9% capacity to filter viruses like hepatitis c virus was connected to a port site with the help of an endotracheal tube connector (Fig. 1). This port site was used for passive smoke evacuation and was discarded after use.
6. As there is a small chance of Co₂ leakage during instrument change, instrument changes were kept to a minimum.
7. Use of ultrasonic scalpels was avoided.
8. 1% Sodium hypochlorite solution was kept in the suction cannister to decontaminate any fluid being suctioned.
9. Vaginal tube was used to occlude the vagina and prevent gas leakage during colpotomy.
10. Before removal of the hysterectomy specimen, complete evacuation of the pneumoperitoneum was done. Reinflation was done only after vagina was occluded completely.

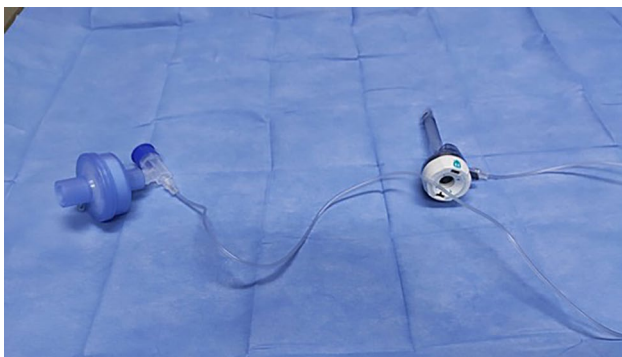


Fig. 1 Viral filter connected to port site through an endotracheal tube connector

11. At the end of surgery, before removing trocars, complete evacuation of the pneumoperitoneum was ensured.
12. All the monitors and workstations were covered with plastic sheet. Non-essential equipment and paper registers were removed from the OR.
13. At the end of surgery, all surfaces were decontaminated with 70% alcohol or 1% sodium hypochlorite.
14. The reusable instruments were washed with soap and water and sterilised using ethylene oxide.

Robotic-assisted surgery has the advantage of less number of instrument changes and requiring less number of assistants. The surgeon's console in robotic-assisted surgery should be cleaned before and after surgery with 70% alcohol to decrease the chance of infection spread between surgeons, if by chance one operating surgeon turns out to be positive.

In addition to these precautions, anesthesia personnel used intubation box (Fig. 2) during intubation to decrease aerosolisation. Only surgeon, one assistant surgeon, scrub nurse, one circulating nurse and one OR technician were allowed inside the OR in addition to the anesthesiologist and anesthesia technician. There was one nurse posted outside the OR to hand over any instruments needed from outside. After each procedure, the intubation box was sterilised with 1% sodium hypochlorite spray. The surgical team did not leave the OR till the end of procedure. Personal protective equipment (PPE) was worn by the operating team. N95 masks, eye protection and face shields, non-permeable gowns and shoe covers were used.



Fig. 2 Intubation box being used for endotracheal intubation

Additional cost incurred was Rs 750 which was one time cost for the intubation box and Rs 700 (per use) for the smoke evacuation system in addition to the cost of N 95 masks and PPE.

During this COVID-19 pandemic period, we are seeing a lot of health care personnel being affected by the disease and many even succumbing to the disease. Any precaution that can help to prevent the dissemination of infection should be taken up and information about such measures should be disseminated widely to help our colleagues in the field.

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Declarations

Conflict of interest Dr. Anupama Rajanbabu is proctor & Advance trainer for Robotic surgery.

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