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.

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Committee Opinion

Joint Statement on Minimally Invasive Gynecologic Surgery during the COVID-19 Pandemic

Introduction

The American Association of Gynecologic Laparoscopists joins the American Urogynecologic Society, International Gynecologic Cancer Society, Society of Gynecologic Oncology, Society of Gynecologic Surgeons, and the Canadian Society for the Advancement of Gynecologic Excellence, in providing the following recommendations for obstetrician-gynecologists during the COVID-19 pandemic.

The surgical care of gynecologic patients during the coronavirus disease (COVID-19) pandemic presents numerous challenges regarding not only patient and community safety but those of the physicians and the operating room personnel. Guidance around minimally invasive gynecologic surgery is a rapidly evolving topic, and the information presented in this editorial is subject to change as new data becomes available.

Urgency of Surgical Treatment

The American Association of Gynecologic Laparoscopists, along with many other surgical and women's health professional societies, support suspension of nonessential surgical care during the immediate phases of the COVID-19 pandemic. Please refer to the American Association of Gynecologic Laparoscopists' joint statement on elective surgeries dated March 16, 2020 [1].

In addition, depending on the degree of urgency, patients who are COVID-19 positive may be best served by delaying surgical procedures until their infection is resolved. However, in some instances, gynecologic surgical care may be deemed essential and unable to be delayed. We have outlined important safety information to consider when performing gynecologic surgery during this time.

Universal Evaluation

The COVID-19 status of every patient should be evaluated by preoperative screening on the day of surgery including history, physical examination, and patient questionnaire regarding flu-related symptoms (Supplemental Appendix) and exposures.

When possible, COVID-19 testing should be undertaken for symptomatic and at-risk patients before surgery. As testing becomes more rapid and readily available, universal testing for COVID-19 may be recommended.

Considerations in mobilizing appropriate protective gear for healthcare workers should be made on the basis of the prevalence of the disease on a local level regarding the interpretations of test results owing to the risk of false negative results early in the course of disease; patients with unknown COVID-19 status may be considered "positive until proven otherwise." Providers in some areas of the world who were affected early in the global pandemic have advocated for additional imaging evaluation (computed tomography of the chest) before any surgical procedure because of the suggestion of superior predictive ability in early disease [2].

Personal Protective Equipment for Operating Room Personnel

COVID-19 virions are 50 to 200 nm in size; however, N95 masks are rated to filter, with 95% efficiency, particles that are larger than 300 nm in size [3,4]. There is evidence to suggest that conventional surgical masks may provide a similar level of protection as the N95 mask in general-use conditions [5], and providers should employ the equipment deemed appropriate by their respective institutions.

It is recommended that anyone working in the operating room use full personal protective equipment (PPE), which includes shoe covers, impermeable gowns, surgical or N95 masks, protective head covering, and gloves and eye protection. In addition, movement of personnel in and out of the operating room should be strictly limited, with efforts made to limit staff breaks midcase when possible. Trainee participation should be limited and include only personnel essential to the safe performance of the operation to avoid exposure and preserve PPE resources.

Surgical Approach

Potential concerns exist regarding the aerosolization of viral particles by electrosurgical and ultrasonic device use at the time of surgery, which could then theoretically be

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transmitted to the operating room environment. In addition, with laparoscopy or robot-assisted laparoscopy, the sudden release of trocar valves, nonair-tight exchange of instruments, or specimen extraction through abdominal or vaginal incisions may potentially expose the healthcare team to aerosolized viral particles. Although it is important to acknowledge these concerns, at present, they remain theoretic in relation to the risk of transmission of COVID-19 to operating room personnel. There is no available evidence from the COVID-19 pandemic or from previous global influenza epidemics to suggest definitively that respiratory viruses are transmitted through an abdominal route from patients to healthcare providers in the operating room.

Laparoscopic and Robot-assisted Approach to Gynecologic Surgery

The following are recommendations for best practice when laparoscopy or robot-assisted laparoscopy is performed (level 3 evidence based on expert opinion):

(1) Employ electrosurgical and ultrasonic devices in a manner that minimizes the production of plume, with low-power setting and avoiding long desiccation times.
(2) When available, make use of a closed smoke evacuation/filtration system with ultra-low particulate air filtration capability.
(3) In addition, a laparoscopic suction may be used to remove surgical plume and desufflate the abdominal cavity; do not vent pneumoperitoneum into the room.
(4) Use low−intra-abdominal pressure (10−12 mm Hg) if feasible.
(5) Avoid rapid desufflation or loss of pneumoperitoneum, particularly at times of instrument exchange or specimen extraction.
(6) Tissue extraction should be performed with minimal carbon dioxide escape (desufflate with a closed smoke evacuation/filtration system or laparoscopic suction before minilaparotomy, making an extraction incision, vaginal colpotomy, etc.).
(7) Minimize blood/fluid droplet spray or spread.
(8) Minimize leakage of carbon dioxide from trocars (check seals in reusable trocars or use disposable trocars).

Vaginal and Laparotomic Approach to Gynecologic Surgery

Similar concerns exist in relation to the aerosolization of viral particles with the use of handheld electrosurgical devices and plume release directly into the operating room environment in an uncontrolled fashion; these concerns are also unproven in relation to COVID-19 disease transmission. Collaboration with anesthesiology colleagues and discussion of performing vaginal and open procedures under regional anesthesia are appropriate to avoid the aerosol-generating events of intubation and extubation.

Considerations regarding the choice of surgical route include patient comorbidities (such as but not limited to obesity, diabetes, and cardiovascular disease) that could result in higher morbidity from laparotomic procedures. In addition, prolonged hospitalization for recovery after laparotomy could expose patients to a higher risk of nosocomial infection including COVID-19 and could place a higher burden on the healthcare system.

The following are recommendations for best practice when a vaginal or laparotomic procedure is performed (level 3 evidence based on expert opinion):

(1) Perform dissection and vascular control using nonelectrosurgical techniques when possible.
(2) Employ electrosurgical and ultrasonic devices in a manner that minimizes the production of plume, with a low-power setting and avoiding long desiccation times.
(3) Smoke evacuators should be used alongside ultra-low particulate air filtration filters where possible. Use a suction device to remove any surgical plume as it is produced.
(4) Minimize blood/fluid droplet spray or spread.

Hysteroscopic and Other Procedures

The risk of COVID-19 transmission at the time of hysteroscopy with bipolar electrosurgical devices and normal saline as the infusion medium is unknown but is theoretically low. Standard droplet precautions are recommended for PPE. The risks related to laser vaporization and conization procedures are also undelineated, and the aforementioned recommendations about minimization and evacuation of surgical plume apply.

Summary and Recommendations

Surgery for gynecologic patients during the COVID-19 pandemic should be approached on a case-by-case basis, taking into account patient-level factors and local resources. Minimally invasive and vaginal approaches to surgery are associated with lower morbidity for the patient in many cases, as well as shorter hospitalization. The data on the risk of surgical plume exposure and transmission of COVID-19 are limited. There are strategies for all surgical approaches that can help mitigate the risk of exposing operating room personnel.

Supplementary Material

Supplemental Appendix.

Symptoms associated with COVID-19 according to World Health Organization and Centers for Disease Control and Prevention.

Common symptoms:

Fever, Dry cough, Fatigue, Shortness of breath.

Other associated symptoms:

Muscle aches, Sore throat, Diarrhea, Nausea/vomiting, Runny nose https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html https://www.who.int/health-topics/coronavirus#tab=tab_3

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