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Seminars in Perinatology

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Gynecologic surgical considerations in the era of COVID-19

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ARTICLE INFO

Keywords:

COVID-19
Coronavirus
Hysterectomy
Gynecology
Surgery

ABSTRACT

The goal of this chapter is to review the various considerations necessary to safely perform gynecologic surgery in the setting of a viral pandemic. The ability to triage surgical cases at a time of reduced resources is facilitated by both state and national societal guidelines in addition to various scoring systems. Concerns by health care personnel of viral transmission intra-operatively require appropriate use of PPE and pre-operative COVID-19 testing. Implementation of mitigation strategies around aerosol-generating procedures such as laparoscopy protects health care personnel involved in the surgical care of the patient.

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Introduction

The emergence and spread of COVID-19 in the United States led to the rapid curtailment of elective surgical procedures.¹ In mid-March, 2020, recommendations were released to postpone elective surgical interventions when feasible.¹⁻³ These recommendations were based on two main concerns. First, the desire to protect patients and health care workers from exposure to COVID-19 and the risk of related complications and second, to preserve hospital resources for the increasing number of patients with COVID-19. This deferment of elective surgery led to discussions surrounding methods of adjudicating priority for which cases outside of emergencies could proceed during this time of restricted surgical access. Gynecologic surgery in the midst of this pandemic also raised concerns regarding transmissibility of the virus in the intra-operative setting. As a result, this chapter will focus on

methods by which to triage gynecologic surgical procedures and upon entry into the operating room, ways to mitigate potential transmission of COVID-19 to surgeons and operating room personnel.

Triage of Gynecologic Surgical Procedures

Both patients and providers are at significant risk when procedures are performed in patients with COVID-19. While there are limited data describing the operative outcomes of women with COVID-19 who undergo surgery, early reports suggest that these patients are at significant risk for perioperative morbidity and mortality.⁴ In addition to direct adverse outcomes for patients, operating room personnel and staff are at substantial risk for exposure and transmission in patients with COVID-19.⁵

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The second major consideration for the triage of surgical patients focuses on logistical concerns and local resource availability. As the number of patients with COVID-19 related disease has risen rapidly, the demands of many hospitals and healthcare systems have been taxed.⁶ Although COVID-19 related infection is commonly asymptomatic or results in only mild disease, approximately 5% of patients will experience severe, life threatening complications.⁷ Those patients who are hospitalized often require mechanical ventilation and critical care services and frequently are hospitalized for a prolonged period of time.^{7–9}

The influx of patients hospitalized with COVID-19 poses a number of logistical challenges for hospitals. Additional inpatient facilities, including intensive care units, may be needed at centers in regions with a high burden of COVID-19 disease. Hospital surge planning may require operating rooms, post anesthesia care units, or other perioperative facilities to be converted into clinical care units for COVID-19 patients. These additional units require staffing, which may call upon surgeons, anesthesiologists and perioperative nursing and support personnel for redeployment and support. Other logistical challenges including shortages in personal protective equipment (PPE) have been well documented.¹⁰ Some regions may experience shortages in ventilators, blood or other needed supplies.⁶ Finally, many hospitals have adopted policies to limit visitors, which may be particularly challenging for patients who undergo surgery.

Despite the desire to limit operative procedures, urgent and emergent surgical procedures need to continue to be performed in some capacity. As surgical triage of patients poses a number of ethical considerations, several risk stratification schemas have been developed to help triage patients when operating room capacity is limited. In general, these triage systems attempt to quantify and balance the medical needs of patients in conjunction with logistical constraints of a hospital and region.

Assessment of the medical needs of a procedure should take into account the consequences of progression of the disease without surgery, as well as the availability of non-operative treatments for the underlying disease process.^{1,2} Additional characteristics of the procedure including anticipated length of hospital stay, potential for ICU admission and risk of complications also influence decision making.¹¹ The medical assessment of the need for surgery should account for the possibility of lengthy delays (6–8 weeks) for procedures that are postponed.¹ Ideally, triage decisions should be made through a review-governance committee that involves the collaborative efforts of surgeons with knowledge of the procedure and disease process as well as administrative personnel with an understanding of the resource constraints of the hospital and community.¹ As there is widespread variation in the burden of COVID-19 in different regions of the country, triage decisions will depend greatly on local conditions.¹ Additionally, as COVID-19 continues to evolve, continual reassessment of the medical needs of patients and logistical concerns are essential.¹

A number of semi-quantitative surgical triage algorithms have been developed. The Medically-Necessary, Times-Sensitive (MeNTS) scoring system uses patient (age, comorbidity), procedural (length of stay, ICU, blood requirements) and disease specific factors (impact of surgical delay) to calculate a

prioritization score.¹¹ The lower the score, the more necessary it is to proceed with a given procedure. The Elective Surgery Acuity Scale (ESAS) groups procedures into tiers based on the medical necessity of the procedure, the location in which the procedure will be performed (hospital or ambulatory surgical center), and the burden of COVID-19 in the region to prioritize procedures.¹

In gynecology, there is little controversy regarding the decision to perform urgent/emergent procedures (ectopic pregnancy, molar pregnancy, and adnexal torsion) and to delay clearly non-urgent procedures, however, for semi-urgent procedures a number of subtleties exist. The Society of Gynecologic Oncology recommends prioritization of procedures for aggressive cancers that metastasize early, curative intent procedures for early stage cancers, surgery for highly suspicious adnexal masses without metastases, and interval cytoreduction.² Similarly, women with benign gynecologic disease with debilitating systems should be prioritized. Similar prioritization schemas may also be needed for the treatment of outpatient gynecologic diseases. The American Society for Colposcopy and Cervical Pathology provided guidance for women with preinvasive lower genital tract disease suggesting that evaluation of high grade dysplasia could be delayed up to 3 months and evaluation of low grade disease for 6–12 months.¹²

State departments of health can serve as excellent sources of guidance on not only the deferment of surgical cases during this era of COVID-19, but also on how to prioritize rescheduling as surgical restrictions are lifted. Complementary to these local sources are joint recommendations produced by several premier national societies on the re-introduction of procedures.¹³

Surgical Mitigation Strategies

Once an indication for surgery has been adjudicated and deemed necessary to proceed there are two key operating room strategies that can be taken into consideration to protect both the surgeon and operating room personnel. The first centers on the proper utilization of personal protective equipment (PPE). There are some clinicians who have advocated for universal respiratory precautions in the operating room based on the fact that COVID-19 is primarily a respiratory disease transmitted through droplets and aerosolization.¹⁴ Although adopting such a policy could reduce the risk for OR staff to develop COVID-19 and facilitate a more rapid return to pre-pandemic surgical volumes, the additional use of PPE, particularly N95 respirators would likely stress reserves and potentially limit implementation.

A more pragmatic approach to managing PPE requirements would be one based on pre-operative COVID-19 status. Because critically ill and unstable emergent cases typically do not allow for enough time to obtain pre-operative testing, those cases should be treated as status unknown or persons under investigation (PUI's) thereby triggering universal precautions with full PPE protocols. On the other hand, elective and semi-urgent cases can undergo PCR-based SARS-CoV-2 testing and based on results manage appropriate PPE requirements. Such testing should take place no earlier than 72 h prior to a scheduled operative procedure and once obtained,

Table 1 – Surgical Mitigation Strategies

Consider use of suction assisted filtered smoke evacuators ¹⁹	Minimize loss of pneumoperitoneum during colpotomy
Ensure all stopcocks are closed on trocars prior to & after insertion; create small skin incisions	Implement controlled desufflation techniques
Avoid instrument & trocar diameter mismatches that result in air leaks	Specimens should be removed after desufflation
Utilize lowest insufflation pressures without compromising exposure	Fascia should be closed after desufflation; avoid facial closure devices
Utilize lowest electro-surgical settings to obtain desired tissue effects	

individuals should practice social distancing and continue to wear a surgical mask. If possible mitigation strategies for COVID-19 should begin at least 2 weeks prior to a scheduled operative procedure. It should be noted that antibody testing for SARS-CoV-2 is not appropriate for pre-operative testing. Implementation of pre-operative testing not only preserves PPE such as N95 respirators and protects health care personnel (HCP) involved in the surgical care of the patient but also helps to identify pre-symptomatic patients who may be at higher risk for adverse clinical outcomes if they undergo surgery prior to developing overt illness with COVID-19.

The exposure risk to communicable diseases in the operating room is typically blood-borne and by adopting the appropriate standard precautions against such pathogens, HCP's should be protected. However there is a paucity of data surrounding the transmission of SARS-CoV-2 intra-operatively. Because SARS-CoV-2 has been detected in body fluids, there has been concern over the transmission of virus from aerosol-generating procedures such as during the use of electro-surgery and venting of insufflation during laparoscopy.¹⁵ As a result a second key operating room strategy that can be implemented to protect both the surgeon and operating room personnel involves intra-operative considerations especially during minimally invasive surgery.

Mitigation strategies can begin prior to incision by first of all, having only anesthesia personnel present in the room during intubation and extubation since that is an aspect of peri-operative care that is known to be an aerosol-generating procedure. Some have even gone so far as to advocate for a barrier enclosure or shield to be used during endotracheal intubation.¹⁶ Minimally invasive surgery, particularly laparoscopy brings the risk of aerosol exposure to the operating team during the establishment and maintenance of pneumoperitoneum as well as use of various energy devices.¹⁷ Hence a multi-faceted approach should be undertaken which includes appropriate PPE and protocols surrounding endotracheal intubation as discussed before in addition to smoke evacuation devices with a suction and filtration system, as available. Ultimately these procedures should be done in rooms with proper filtration and ventilation.¹⁸ See Table 1 for a summary of practical considerations.

Conclusion

As gynecology departments either scale down elective cases or begin the process of re-emerging from a period of surgical dormancy based on where they are on the pandemic curve, the ability to appropriately triage and categorize patient acuity is of

utmost importance. Whether or not elective surgery is completely halted, emergent cases will continue to present and require operative management thereby necessitating a strategy around use of PPE as well as COVID-19 testing. Given the paucity of data surrounding the transmission of SARS-CoV-2 intra-operatively, various considerations can be undertaken to mitigate the risks of infection to operating room personnel.

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