

Recommendation for Gynecological Surgery Approach in the Era of COVID-19 Pandemic- Saudi Arabia

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Introduction

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) took the World by storm, many souls have been lost to this pandemic due to its fast spread and all-inclusive Nature. As a result, numerous guidelines and recommendations have been published on safe surgical environment for both the health care providers and the patients [1].

All around the world strict protocols have been implemented, to limit exposure and preserve personal protective equipment (PPE) For example, many hospitals have stopped elective surgical cases as it is known that surgeries add stress the immune system increasing the risk of developing COVID-19 in silent carriers. But nevertheless, there are some emergency cases that emerge and have to be dealt with for example in field of Gynecology, patient with Ruptured Ectopic pregnancies, Ovarian torsion, Ruptured hemorrhagic cyst to name a few. To elaborate concerns are still being raised in relation to the possible transmission of COVID 19 during gynecological surgery, numerous theories and surgical techniques for have been suggested e.g.: (laparoscopy vs open surgical approach) each claiming to reduce the risk of transmission while treating COVID-19 suspected or confirmed cases.

Objectives

The Aim of this review is to unify protocols and recommendations used in managing patients who require Gynecological surgeries in Saudi -Arabia, provides optimal treatment and providing maximum safety for both healthcare workers and patients themselves to stop the spread of COVID-19. In this article we will be discussing recommendations in regards to:

1. Personal protection equipment (PPE)
2. Optimal safety in the operating theater
3. Surgical approach: Minimal invasive surgery vs Laparotomy
4. Energy modalities and their role in transmission

Methods

An extensive search was conducted reviewing the Database (PubMed) and recommendations that have been suggested by Top medical Associations like the world health organization (WHO), American Association of Gynecologic Laparoscopists (AAGL), the Royal college of obstetrics and gynecology (RCOG) since the onset of COVID-19 that are related to management of gynecological surgery patients during pandemics to the date of this publication

We propose the following adaptations for the management of patients with gynecologic surgery during the COVID-19 pandemic period:

A) PPE: Personal Protective Equipment

Personal protective equipment (PPE) refers to protective clothing, helmets, gloves, face shields, goggles, face-masks and/or respirators or other equipment designed to protect the wearer from injury or the spread of infection or illness [2]. In the aim to reduce the transmission and reduce mortality related to this virus for both health workers and patient themselves Personal protective equipment is mandatory to all operating staff dealing with suspected or confirmed cases of COVID-19 in the Era of this pandemic. Proper donning and doffing techniques should be applied.

The mandatory PPE recommended by central of disease control (CDC) N95 respirator or higher-level filtering mask, disposable Gloves, fluid resistant disposable gowns, disposable eye protection or face shield)

B) Operating Theatre Environment

A negative pressure environment in oppose the usual positive pressure operating room provides maximum reduction in the transmission of the droplet/aerosol born virus outside the theatre.

If this prerequisite is not available in certain institutions a high frequency or filtered air exchange have to be used in aim to reduce possible spread.

The mapping of the operating theater should be carefully studied to allocate the appropriate OR location nearest to the EXIT with access to back corridors providing an alternative pathway for transferring patient IN\Out of operating rooms, to minimize the interaction of the infected or suspected COVID-19 patients with non-infected patients and OR personnel.

C) Energy Modalities

Different energy modalities are used in the setting of gynecological Operation e.g.; (harmonic scalpel, LigaSure, monopolar and bipolar), dissection and coagulation can be achieved with these devices, either in open or laparoscopic surgeries. The downfall of these modalities in suspected and confirmed COVID-19 patient is the fumes and smoke created by, these ultrasonic and electrosurgery devices aerosolize the virus hypothetically increasing the risk of its transmission, so until it is proven it is recommended to decrease their use as much as possible regardless of operational method minimal invasive vs open technique

D) Open vs. Laparoscopic surgery

As the pandemic grows the need for emergency operations will increase, various debates on the method of surgery and intraoperative techniques are ongoing all aim to reduce intraoperative transmission of the virus.

“all laparoscopy” or “all laparotomy” is not appropriate, Risk of open vs minimal invasive approach should be balanced against the possible benefits and desired outcome from each method aiming for shorter hospital stay, reduced smoke and aerosol formations, reduced OR time (decreasing the time of exposure to confirmed or suspected cases), quick recovery, number of operators needed, less exposure to bodily fluids, to conclude the most important factor to be tolled in is the expertise of the operator as patient health is a priority and local resources

The Royal College of Obstetricians and Gynaecologists (RCOG) along with the British Society for Gynaecological Endoscopists (BSGE) recently released a statement on gynaecological laparoscopic procedures and COVID 19. They recommended that laparoscopic approaches should be utilized when feasible in preference to laparotomy (BSGE, 2020). These sentiments have been largely echoed by both the European Society for Gynaecological Endoscopy (ESGE, 2020) and American Association of Gynecologic Laparoscopists (AAGL, 2020). Furthermore, there still remains a paucity of data surrounding the safety of the open approach and the potential transmission risks, including the use of electrosurgery. However, this situation is ever-evolving and the advice may change as the consequences of COVID 19 infection and its methods of transmission becomes more greatly understood [3].

American Association of Gynecologic Laparoscopists recommend the following:

- Employ electrosurgical and ultrasonic devices in a manner that minimizes production of plume, with low power setting and avoidance of long desiccation times.

- When available, make use of a closed smoke evacuation/filtration system with Ultra Low Particulate Air Filtration (ULPA) capability.
- In addition, a laparoscopic suction may be used to remove surgical plume and desufflate the abdominal cavity; do not vent pneumoperitoneum into the room.
- Use low intra-abdominal pressure (10-12mmHg) if feasible.
- Avoid rapid desufflation or loss of pneumoperitoneum, particularly at times of instrument exchange or specimen extraction.
- Tissue extraction should be performed with minimal CO2 escape (desufflate with closed smoke evacuation/filtration system or laparoscopic suction prior to mini-laparotomy, making extraction incision, vaginal colpotomy, etc.
- Minimize blood/fluid droplet spray or spread.
- Minimize leakage of CO2 from trocars (check seals in reusable trocars or use disposable trocars.

E) Robot assisted surgery (RAS)

In a robotic procedure fewer operating staff is needed in the direct vicinity of the patient. A practical problem might arise if theaters suitable for and equipped with a robotic platform is requested as auxiliary intensive care units for COVID-19 patients. As with all dedicated theater spaces, careful considerations should be made which rooms can or should be prioritized for the treatment of COVID-19 patients [1]. A great advantage of using a robotic platform is the fact that in times of extreme shortage of hospital beds hospital stay can be minimized also for urgent patients that need (radical) complex procedures that might not or less be feasible with conventional laparoscopy. In conclusion, RAS may help in minimizing the risk for contamination of healthcare providers and to make optimal use of residual resources [1]. Since the COVID-19 pandemic, blood donation shortages are evident nationwide. Therefore, surgeons and health care systems must consider the local availability of blood products in their surgery scheduling protocols. Care providers in good health should also consider donating blood and encourage others to do so as well [4].

Obstacles Faced and Percussions to Be Taken Intraoperatively:

1. Length Of Hospital Stay

Open surgeries carry a risk of prolonged hospital stay and longer recovery time in contrary to minimal invasive techniques which ensure reduced admission time decreasing the risk of exposure to COVID 19 from prolonged hospitalization for both patients and medical staff, faster recovery and quicker return to daily activity decreasing morbidity and mortality related to immobility.

2. Body Fluids

Molecular studies have detected viral RNA in a range of bodily specimens from COVID 19 patients, including upper and lower respiratory tract samples, faces and blood, indicating the potential presence of infectious virus [3]. presumably thorough transmission from the naso-pharynx with ingestion into the gastrointestinal tract. However, it is less commonly found in blood, with studies reporting viral RNA positive samples in 1-15% of COVID 19 patients (Wang et al., 2020, Chen W et al., 2020, Young et al., 2020, Chan et al., 2020, Huang et al., 2020).

In theory open technique carries higher risk of exposure to bodily fluid, increasing the risk of transmission the infection to operators intraoperatively, and OR personnel in case of body fluid spills.

Laparoscopic and robotic approaches are less fluid generating and carry less exposure to these body fluids, redeeming itself as a safer approach but in contrary some evidence argues that there is no increased risk of infection from body fluid exposure if the medical personnel are wearing full PPE and applying appropriate donning and doffing techniques. For specimen retrieval such as in ectopic pregnancy, deflate the abdomen with a suction device before removing the specimen bag from the abdomen. Re-insert the port before turning CO2 on again [4].

3. Intraoperative smoke and aerosol production:

Although minimal invasive surgeries have lower hospital stay, faster recovery and better overall outcomes, there is concern of increasing the spread of virus COVID-19 to OR staff via aerosolization and smoke generated intraoperatively, both open and minimal invasive techniques can produce these hypothetically infectious particles.

But the effect of these plumes is debatable when Full PPE are in use. Laparoscopic surgeries theoretically have a higher risk of plume formation, as a pneumoperitoneum is created, the insertion and mainly removal of trocars may cause diffusion of contaminated body fluids and virus containing plumes following the use of energy modalities, For that theoretically, although the risk is there for plume formation in open surgeries, they are considered less plausible to cause plumes of the magnitude generated in minimal invasive surgical techniques.

Here are some recommendations to be taken as an extra precaution during laparoscopic surgery; first of all, laparoscopic surgeries should be done by the most experienced surgeon to avoid complication and insure the shortest OR time feasible

A) Insufflation :

port sites should be planned carefully, using as little ports as possible while still providing Ideal setting for a safe and fast OR. great care should be taken on the allocation of these ports, avoiding major vessels and vital organs, that will lead to converting to open surgery, or increase the amount of intra/extra peritoneal fluids attention should be taken to ensure proper port size to avoid any gas leakage. Instrument exchange must be minimized strategic use of energy modalities (cautery, ultrasonic devices) to reduce smoke and gas formation

B) Deflation and End procedure:

At the end of the procedure the intrabdominal gasses have to be deflated slowly via filtered port with smoke suctioning vacuum to prevent the spread of these gasses, also this method can be used in open surgeries when energy modalities have been employed.

Accessory port trocars ideally are removed under direct vision to avoid hernia but in the aim of reducing gas leakage this is not possible so it is advised to remove them blindly while main trocar should be removed under direct vision after deflation.

As for closure of ports, it should be as routine for ports larger than 5 mm using j shaped needle, avoid the usage of enclose devices as they attribute to gas leakage. Minimize sudden gas dispersal during total laparoscopic hysterectomy when the specimen is removed, deflate the abdomen with a suction device before removal of the uterus through the vagina [4].

Table 1: Risk comparison of robot assisted, Conventional laparoscopic and open surgery under COVID-19 Circumstances

Area of risk	Robot assisted surgery	Conventional laparoscopy	Open surgery
Aerosol	Intraabdominal dispersion, limited by filters or locks (no data on COVID-19 in aerosols and risk)	Intraabdominal dispersion, limited by filters or locks (no data on COVID-19 in aerosols and risk)	Less aerosol formation, unconfined dispersion, unfiltered (no data on COVID-19 in aerosols and risk)
Smoke	Confined, filtered	Confined, filtered	Maximal exposure
Blood, body fluids	Hardly if any blood loss, exposure at limited intervals	Hardly if any blood loss, exposure at limited intervals	More blood loss, continuous exposure
Abdominal pressure (mmHg)	<10	10-15	0
Perioperative cleaning of instruments	Large surface of robot, limited number of instruments, less blood contamination	Limited number of instruments, less blood contamination	Large number of instruments, heavy blood contamination
Staff	Typically 1 bedside staff, 1 console staff (remote)	Typically 3 bedside staff	Typically 3 bedside staff
Hospital stay	Short	Short	Longer

Conclusion

Surgery for gynecologic patients during the COVID-19 pandemic should be approached on a case-by-case basis [4]. If all high-level precautions are being taken, Robot assisted surgery (RAS), laparoscopic surgery may offer a safe surgical alternative protecting both the surgical patient, the surgical team as well as the COVID-19 patients that need resources, in particular beds otherwise reserved for those surgical patients. Evidently, if these stringent but necessary precautions cannot all be taken, e.g., by lack of equipment it should be considered whether open surgery would be safer or whether indeed surgery would be feasible at all under the circumstances [1, 5-10].

References

1. Kimmig, R., Verheijen, R. H., & Rudnicki, M. (2020). Robot assisted surgery during the COVID-19 pandemic, especially for gynecological cancer: a statement of the Society of European Robotic Gynaecological Surgery (SERGS). *Journal of gynecologic oncology*, 31(3).
2. Joint Statement on Minimally Invasive Gynecologic Surgery during the COVID-19 Pandemic (2020) *Journal of Minimally Invasive Gynecology* 27(5), 1027-1029.
3. Personal Protective Equipment for Infection Control [Internet]. U.S. Food and Drug Administration. 2020 [cited 14 August 2020]. Available from: <https://www.fda.gov/medi>

-
- cal-devices/general-hospital-devices-and-supplies/personal-protective-equipment-infection-control/
4. Esge.org. (2020), <https://esge.org/wp-content/uploads/2020/03/Covid19StatementESGE.pdf>.
 5. COVID Surg Collaborative, (2020), Global guidance for surgical care during the COVID-19 pandemic. *British Journal of Surgery*, 107(9),1097-1103.
 6. Akladios, C., Azais, H., Ballester, M., Bendifallah, S., Bolze, P. A., Bourdel, N., ... & Touboul, C. (2020). Recommendations for the surgical management of gynecological cancers during the COVID-19 pandemic-FRANCOGYN group for the CNGOF. *Journal of gynecology obstetrics and human reproduction*, 49(6), 101729.
 7. Brown, J. (2020). Surgical decision making in the era of COVID-19: a new set of rules. *Journal of Minimally Invasive Gynecology*, 27(4), 785-786.
 8. Bogani, G., & Raspagliesi, F. (2020). Minimally invasive surgery at the time of COVID-19: the OR staff needs protection. *Journal of minimally invasive gynecology*, 27(5), 1221.
 9. Boon, I. S., Yong, T. A., & Boon, C. S. (2020). Effect of the COVID-19 Pandemic on Cancer Clinician Decision Making: Known Knowns and Known Unknowns. *Clinical Oncology*, 32(8), 547-548.
 10. Dowdy, S., & Fader, A. N. (2020). Surgical considerations for gynecologic oncologists during the COVID-19 pandemic. *Society of Gynecologic Oncology*, 1-4. <https://www.sgo.org/resources/surgical-considerations-for-gynecologic-oncologists-during-the-covid-19-pandemic/>.

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