



# Consideration of laparoscopic metabolic and bariatric surgery during COVID-19 pandemic

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**Abstract:** COVID-19 pandemic has severely challenged the healthcare resources and impacted the medical practice globally. In most of the nations involved, non-urgent, non-cancer procedures have been suspended to reallocate medical and paramedical staff to combating the pandemic and emergency cases. Laparoscopic metabolic and bariatric surgery (LMBS) was traditionally classified as elective procedures, therefore, a great number of hospitals have postponed or even cancelled such procedures during the outbreak of COVID-19. In addition, many of the bariatric surgery candidate patients are also worried about acquired infection if staying in the hospital. However, since the pandemic is predicted to be last for a relatively longer time as we expected, we have no reason not to resume elective procedures if resources are allowed. This paper focuses particularly on the impacts of COVID-19 pandemic on LMBS and when and how to resume it orderly. A special caution protocol should be developed and implemented when caring patients in order to minimize or even prevent the virus transmitting and spreading inside healthcare facility. The protocol includes triage and prioritization of patients, screening, protections in the inpatient ward, in the operating theater, and after surgery. The goal of enforcing these protocols is to help restarting our practice during the “new normal” era. The core principles of this protocol can also be applied to any surgical specialties.

**Keywords:** COVID-19; laparoscopic metabolic and bariatric surgery (LMBS); elective procedures

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## Introduction

COVID-19 is an infectious disease caused by the infection of a novel type of coronavirus named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus invades host cells via the enzyme called angiotensin-converting enzyme 2 (ACE2) (1). Since this enzyme is abundant in type II alveolar cells of the lungs, the lungs are most affected by COVID-19. The COVID-19 pandemic had overwhelmed the health systems of almost every country in the world, resulting in a significant number of deaths in the world (2). As of August 20, 2020,

there have been about 22.5 million confirmed cases of COVID-19, including over 79,000 deaths globally. In addition, there are also a great number of persons who are asymptomatic or undiagnosed. Anti-viral agent Remdesivir has been approved by the United States Food and Drug Administration (FDA) for the treatment of COVID-19, but the efficacy is not as potent as we expected (3). So far no other investigational anti-SARS-CoV-2 medications seems to be promising. Although vaccines from different resources have shown protective effect against SARS-CoV-2, they still need to take a long way for phase 3 clinical trial to verify their efficacy and safety (4). Therefore, it seems that

COVID-19 pandemic will continue soaring for a while until vaccines are available for clinical use.

### **How COVID-19 affects laparoscopic metabolic and bariatric surgery (LMBS)**

The goal of LMBS is to treat obesity and related comorbidities with a minimally invasive approach. The outbreak of COVID-19 caused healthcare crisis including shortages of hospital/ICU beds, critical medical equipment, personal protective equipment (PPE), as well as workforce and staff. Therefore, healthcare resources have to be re-allocated and prioritized. Since obesity has not been considered as a lethal condition traditionally, LMBS was classified as elective surgery (5). In most countries, the elective surgery is usually postponed or even cancelled during the pandemic. Recent data show that the mortality rate caused by COVID-19 was significantly higher among patients in obese condition and with chronic metabolic disorders (6), meaning prolonged delay of LMBS increases risks for morbidity and mortality. Therefore, a variety of expert consensus and clinical practice guidelines have been published to support re-classifying the metabolic and bariatric surgery as “medically necessary time-sensitive surgery” (7) and to advocate resuming of LMBS during COVID-19 pandemic (8-11).

### **Resuming LMBS during COVID-19 pandemic**

#### *Triage and prioritization*

For obese patients who are candidates of LMBS, the surgery is not an urgent requirement in most scenarios. However, prolonged delays of this beneficial treatment may pose threat to clinical outcome. Therefore, a triaging protocol needs to be designed and enforced for the purpose of prioritization of LMBS based upon each patient's benefits/risk balance. For each patient, a multidisciplinary team should carefully stratify the severity of obesity and related disorders to evaluate whether delay of surgery will affect the patient's morbidities during waiting period, and how the clinical outcome will potentially be affected if the surgery is postponed. For patients who may have a higher mortality due to obesity and related disorders and poor cardiopulmonary function if infected with COVID-19, or who are in lethal condition which could be improved by LMBS, LMBS should be prioritized. Otherwise, the schedule of surgery will depend on the availability of

healthcare facility and staff as well as supply resources.

#### *Screening*

Pre-hospitalization screening for COVID-19 should be treated as a must (12). In our practice, reverse-transcriptase polymerase chain reaction (PCR) test of SARS-CoV-2, antibody test, complete blood counting (CBC) with C-reaction protein (CRP), and chest computed tomography (CT) are mandatory as screening protocol. In addition, patients should be questioned if there is a history of closed contact with COVID-19 positive patients or travel to high risk area. A positive PCR test means that the patient is currently infected by the virus. However, the rate of false negative can be high due to the existence of virus at sampling site, or the qualities of sample and laboratory handling. Sometimes, cases in very early stage and very late stage of COVID-19, PCR test can also be negative. A positive antibody test means that the body has become immune to the virus due to current or past infection. Usually both IgM and IgG are tested. Positive IgM usually means a recent infection while positive IgG past infection (13). All the tests should be considered before the patient is admitted. There still remains a lot unknown regarding the biology of COVID-19. False negative and asymptomatic are common among the people who are tested. The combination of different testing regimen is thought to be able to improve both sensitivity and specificity of COVID-19 infection. The outcome of screening usually falls into one of three scenarios: confirmed COVID-19 positive cases, confirmed COVID-19 negative cases, or suspected cases. Negative patients can be admitted without any restriction, while positive and suspected patients need to wait for two more weeks and re-screening before admission unless the patient is in emergency condition.

#### *Protection in the inpatient ward*

Personal protection equipment (PPE) is crucial in the healthcare facility. Corrected usage of PPEs is able to minimize the virus spreading among patients and physicians. During the outbreak of COVID-19 in the area where the hospital is located, both the healthcare personnel and patients should wear face masks all the time. In most areas, surgical masks usually should be sufficient. Single patient room is strongly recommended. Patients should be educated with principles of hand hygiene, and are encouraged to stay inside the ward room. Leaving the

ward area must be reported and approved by the floor chief nurse. There should be a specific quarantine area in the ward reserved for patients who are admitted emergently and still expecting the results of screening.

### *Protections in the operating theater*

In the operating theater, at least one negative pressure operating room (OR) is strongly recommended for COVID-19 positive and suspected patients (14,15). For the emergency surgery on COVID-19 positive or suspected patients, cautions should be taken carefully. Level 3 PPE protections, including disposable surgical cap, disposable gloves, disposable shoe covers, anti-fog safety glasses or face shield, protective cover-all suit, N95 masks or higher, and even full face respirator or positive pressure headgear are required on the way transporting the positive or suspected patients to operating theater and when in OR. A minimum number of personnel is allowed in OR. And it is also advised to adopt short-duration procedures instead of long procedures (>120 minutes) (10).

When operating on the positive or suspected patients, try to minimize the use of electrocautery and ultrasonic devices. Low power setting and avoidance of long desiccation time are recommended. When doing laparoscopic surgery, laparoscopic suction is useful to remove surgical plume and de-sufflate the abdominal cavity. Remember not to vent pneumoperitoneum directly into the room. If available, a filter should be adopted. A lower intra-abdominal pressure (10–12 mmHg) is preferred if feasible. Specimen extraction should be performed with minimal CO<sub>2</sub> escape, i.e., after complete emptying of the pneumoperitoneum. Always minimize leakage of CO<sub>2</sub> from trocars and minimize blood/fluid droplet spray or spread. In addition, try to avoid the use of drainage tubes, urinary catheter, nasogastric/orogastric tube, gastric feeding tube, etc. The OR room should undergo a detailed decontamination with chlorine-containing disinfectants followed by ultraviolet (UV) disinfection (16,17).

If the patient has been screened and confirmed negative, the protocol in OR is the same as usual and level one PPEs including scrub, disposable surgical cap, disposable gloves, disposable surgical gown as well as disposable surgical mask, should be sufficient.

### *Protections after surgery*

COVID-19 positive patients should be transferred to a

designated room or hospital after surgery. For the patients whose screening results have not been reported before entering the OR due to emergency situation, they can wait in OR after surgery until screening results are reported, or should be transferred to a designated quarantine ward room. Remember to change PPEs when exiting OR. The COVID-19 negative patients follow the hospital's routine OR exiting protocol. Enhanced recovery protocol is strongly recommended in order to minimize the length of stay in hospital. Patient visits should be limited. If it is really needed, the visitors should undergo the same screening test before entering into inpatient area.

### **Conclusions**

It has been over half a year since the outbreak of COVID-19 pandemic. Although there is neither a robust anti-virus treatment nor an approved vaccine to prevent the virus infection, we have learned a lot as a healthcare personnel on how to minimize the transmitting and spreading in our healthcare facility and our community. It is predicted that the pandemic will still last for a couple of years, meaning that we have to deal with this “new normal” in our daily life. By pre-hospitalization screening and triage, we precisely treat each patient depending on their health status and COVID-19 infection status. With special cautions and protection protocol in ward and OR, elective surgery should be safe to operate. It does not make sense to unnecessarily discontinue elective surgical procedures during the new normal era.

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