

Covid -19: Perioperative Consideration during Emergency Surgery

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Abstract COVID-19, a pandemic infectious disease has created havoc worldwide with rising count of affected people at an alarming rate. Health workers are making untiring efforts akin to soldiers at frontline around the globe. Infection prevention and control measures play a pivotal role in perioperative management of COVID-19 patient during emergency surgery. A strict anesthesia and surgical protocol can prevent the cross-infection while providing care to the patient in the perioperative settings. New research and guidelines are underway in different phases of completion

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I. Introduction

Covid-19 has created havoc worldwide with rising count of affected people at an alarming rate. World Health Organization (WHO) declared novel corona virus outbreak a “pandemic” on March 11th, 2020. Health workers are making untiring efforts akin to soldiers at frontline around the globe. Anesthesiologist and surgeon may be involved in resuscitation, airway management, peri-surgical as well as critical care of such cases. In this scenario, elective surgeries should be deferred till the outbreak of COVID-19 is contained. Only emergency surgeries should be undertaken. The decision for urgent and time-sensitive procedures (cancer surgeries) can be taken as a team, based on the available resources and patient’s clinical condition [1].

Preanesthetic preparation For any emergency surgery in such patients, planning of anesthesia becomes very crucial while taking all the necessary precautions. Preanesthetic checkup must be done in the isolation room where the patient is kept. Personal Protective Equipment (PPE) should be used for preventing transmission from patient to the anesthesiologist. Patient maybe symptomatic, therefore a preanesthetic checkup should include history of fever, cough, dyspnoea and other co morbidities. The radiological findings reported in these cases range from diffuse segmental or sub-segmental ground-glass opacities signifying interstitial edema seemingly like “paving-stone” with extensive exudation into alveolar cavities leading to patchy areas of consolidation [2]. After taking due consent for the procedure, it is important to counsel the patient’s relatives regarding need for strict isolation. Roles should be allocated as 1st & 2nd intubators, drug administrator, team leader and runner.

Operation theatre Dedicated operation theatres should be used for all confirmed or suspected COVID-19 infected patients. COVID-19 infected patients should be wheeled through separate/isolated corridors to the operation theatre. Operation theatre (OT) should have preferably be negative pressure system with minimum 12 air exchanges per minute at least 160 liters/second/patient in facilities with natural ventilation [3]. In case of positive pressure system air conditioner should be switch off. The patients should be wheeled directly in to the OT. They should not stay in pre-medication room at all. All operation theatre staff should wear PPE including anesthesiologists, surgeons, nurses, technician, bearer, sweeper, etc. PPE included one piece special gown, properly fitted N95/N99 mask, eye shield, shoe cover and double gloves. Tracheal intubation should be done by experienced anesthesiologists to limit the number of intubation attempts. Limit the number of anesthesia team personnel (maximum three) inside the OT. Second clinician with PPE can be available outside the OT for immediate assistance. The ability to communicate is limited by PPE, therefore it is important to do mock drill for intubation/ extubation wearing PPE. Clinicians can use sign language or paper and pen to communicate with each other.

Place all equipments and drugs required for the anesthetic management in a tray and avoid handling of the drug trolley during the case. Equipments should include standard airway equipment, prefer disposable devices. Difficult airway trolley, crash trolley/ defibrillator can be kept outside and at handy position. Their position should be identified before starting the procedure. Second doctor should be available with donned PPE

outside the chamber. Prefer disposable monitoring equipment, if possible a dedicated ultrasound machine can be used. Ultrasound machine may play a vital role in invasive procedures, regional anesthesia, nerve blocks, assessment of cardiovascular function and fluid responsiveness. Place two high quality Heat and Moisture Exchange Filters (HMEFs). First, between tracheal tube and breathing circuit; and the second between expiratory limb and anesthesia machine [4].

Anesthetic management Prefer regional anesthesia, where ever possible. A surgical mask or N95 mask must be applied to the patient throughout the length of stay in the operating room. In case supplementary oxygen is needed, the oxygen mask is applied over the surgical mask or N95 mask. For general anesthesia, pre-oxygenate for five minutes with 100% oxygen. Avoid high flow oxygen to prevent aerosolization. Rapid sequence induction (RSI) and tracheal intubation should be done in the first attempt and confirmed using capnography. Avoid manual ventilation to prevent aerosolization of virus from airways. In cases of severely decreased PO₂/FiO₂ ratio, modified RSI can be done. If manual ventilation is required, apply small tidal volumes. Ensure adequate neuromuscular blockade to avoid bucking that can increase aerosolization. Immediately inflate the endotracheal (ETT) tube cuff, clamp it and connect to the ventilator. Unclamp the ETT before starting ventilation; confirm the position of ETT by capnography. The choice of induction drugs is dictated by hemodynamic considerations. Ensure adequate analgesia, injection fentanyl may be preferred. Avoid awake fiberoptic intubation; nebulization with local anesthetic will aerosolize the virus. Videolaryngoscope can be used to improve intubation success and it may increase the distance between the patient's airway and intubating anesthesiologist [4]. Use low gas flows and closed circuits. Total intravenous anesthesia (TIVA) can be used for maintenance of anesthesia. Limit the ventilatory disconnections. Use a closed airway suction system preferably. Supraglottic airway devices should be used only in 'cannot ventilate' situations. Since most of these patient may require high sealing pressure so a securing the airway with endotracheal tube should be preferred. Prophylactic administration of anti-emetic drug is preferred to reduce the risk of vomiting and viral spread. The depth of anesthesia should be maintained at all times to prevent any bucking in between the procedure. The setting of ventilatory parameters should be in accordance with the lung protective strategies with optimal PEEP and Pplat <35 mmHg to achieve a SpO₂ >90% and admissible hypercapnia [5]. Tracheal extubation should be done on table, as far as possible. Antitussive drugs such as remifentanyl, lidocaine and dexmedetomidine reduce the risk of coughing and minimize agitation on extubation. "Mask over tube" technique can be used during extubation as explained by David.F et al [6].

Postoperative management After tracheal extubation, patient should be transferred to the isolation ward. If tracheal extubation is not feasible, then shift the patient to designated Intensive Care Unit (ICU). During transfer, the team should wear proper PPE outside the operating room. The patient should be covered with one disposable operating sheet and then transferred through a dedicated lobby and elevator. The patient must wear a surgical mask or N95 mask during transfer. The surfaces of passage ways and the elevator should be cleaned. If the patient is kept intubated, a single patient use Ambu bag with HME filter attached must be used during transfer. Do not use a ventilator during transfer. Discard breathing circuit, mask, tracheal tube, HME filters, gas sampling line and soda lime after every patient. Water trap to be changed if it becomes potentially contaminated. Seal all used airway equipment in a double zip locked plastic bag [7]. It must then be removed for decontamination and disinfection. Decontamination of all surfaces, screens, keyboard, cables, monitors and anesthesia machine with 2 to 3% hydrogen peroxide spray disinfection, 2-5 g/l chlorine disinfectant, or 75% alcohol wiping of solid surfaces of the equipment and floor should be done at the end of the procedure. The hydrogen peroxide vaporizer is an added precaution to decontaminate the OT.

All unused items on the drug tray and airway trolley should be assumed to be contaminated and discarded. All staff has to take shower before resuming their regular duties.

Conclusion Infection prevention and control measures play a provital role in perioperative management of COVID-19 patient during emergency surgery. A strict anesthesia and surgical protocol can prevent the cross- infection while providing care to the patient in the perioperative settings. New research and guidelines are underway in different phases of completion till the writing of this article. New therapeutic agents and vaccine may provide a hope along with general precaution to contain this pandemic.

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