ROADMAP TO RESTARTING ELECTIVE SURGERIES POST COVID 19 PANDEMIC - AN ANESTHETISTS PERSPECTIVE

Anaesthesiology

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ABSTRACT

Corona Virus Disease (COVID 19) is a respiratory infection caused by SARS-CoV-2 or COVID 19 virus which struck the world in November 2019 rapidly spreading and attaining the form of a pandemic by March 2020. The disease was officially named as Coronavirus Disease-2019 (COVID-19) by WHO on February 11, 2020. Spread is predominantly through respiratory droplet and close contacts with infected individuals. Airborne transmission is possible during aerosol generating medical procedures as the virus is abundantly present in nasopharyngeal, salivary secretions and body fluids of affected patients. During the pre-peaking, peak and plateau phase of the epidemic, non-emergency surgeries and invasive procedures took a backseat as all resources of healthcare providers were put to combat the disease. As the pandemic fades away the need of adapting the healthcare facilities and restarting elective surgeries has to be addressed. In this article we try to highlight the various challenges faced by the surgeons, anesthetists and healthcare professionals to restart elective surgical work. The strategies to overcome these hurdles are also discussed.

KEYWORDS

COVID 19 pandemic, Facility readiness, Infection control, Personal protection equipment (PPE), Restarting elective surgeries.

Background

The COVID 19 pandemic had put a hard stop on all activities globally, especially elective surgeries and procedures at all medical facilities. It is a worldwide challenge to restart elective surgeries during and after COVID 19 pandemic⁽¹⁾. As per recommendations from national and international societies like ISA (Indian Society of Anesthesiologist), ASI (Association of surgeons of India, ACS (American College of surgeons), ASA (American society of Anesthesiologists) elective surgeries and procedures among all subspecialties were put on hold during the stages of pre-peaking, peak and plateau of the epidemic^(2,3,4). The backlog of deferred surgical cases is ever increasing. We need to start someday as elective cases will turn emergent and emergent cases will transform into emergency cases. As Benjamin Franklin stated "Failure to plan, is planning to fail". The pandemic caught us off guard without adequate time to plan but for the next deluge of surgical cases we need a proper plan.

Facility readiness to resume elective surgery will vary by geographic location⁽⁵⁾. As well as on updates and guidelines provided by local governing bodies. The pandemic has placed unprecedented demands on the resources be it trained healthcare professionals or infrastructure. There has been repurposing of surgical wards, ICU beds, operating rooms and relocation of Anesthesiologists, Surgeons and Nurses in an attempt to care for the enormous number of COVID affected patients⁽¹⁾. The aim to defer elective surgery was to reduce infection risk to patients, healthcare providers and to conserve critical resources. The next challenge for the healthcare system will be to manage the surge of COVID patients as the country gets fully unlocked and to gradually resume surgical work till the time normalcy is reached. This is a greater challenge given the burn out of existing medical staff.

Main Article

During the acute phase of COVID 19 pandemic we have conducted our share of emergency cases which have been tackled as per the guidelines laid by international and national societies. These Standard Operating Procedures (SOPs), algorithms and lessons learnt in an attempt to follow best clinical practices for patient care will form the foundation on which we build and improvise as we go. COVID 19 pandemic is going to be around for months to come. We will have to learn to coexist with it while we keep it in check and win the battle of survival against COVID. Proper COVID 19 surgical plan which will address every stage of surgical care, the pre-operative, intraoperative and post discharge should be in place before restarting elective surgeries. Lack of definitive treatment, high infectivity of the virus, fear of aerosol transmission, the physical challenge to work with PPE calls for a huge change in the current surgical practices which will be dynamic and ever changing.

Issues to be addressed

When to restart	a. Sustained reduction in new cases of COVID 19 in the geographic area for at least 14 days. ^(6,7,8,9) b. Availability of appropriate non COVID ICU and non-ICU beds. c. Availability of personnel and medical and surgical supplies.
Pre-op COVID testing	According to current public health guidelines for testing and home isolation If COVID testing is not available, then standard infection prevention and control techniques like appropriate PPE should be used.
COVID consent	COVID consent in view of increased peri-operative surgical morbidity and mortality in asymptomatic carriers and those who contract the infection during the hospital stay.
Measures for controlling infectivity peri-operatively	PPE, sanitization, segregation, isolation, restricting number of relatives accompanying the patients. Strict adherence to social distancing norms.
Remodeling the OR areas	Special donning, doffing and dedicated separate OR for positive cases and suspect cases.
Case scheduling and prioritization	Multi-disciplinary shared decisions regarding surgical scheduling should be made in the context of available institutional resources that will be variable and rapidly evolving.
Mental health and wellbeing of HCP - which is a parallel pandemic	Post-traumatic stress disorder (PTSD) ^(10,11)

Health Care Provider (HCP), Operating Room (OR), Personal Protective Equipment (PPE)

Revised strategies:

1. Phased opening of the operating rooms should be planned. Initially starting with day care surgeries and then sequentially other ORs as per availability of resources should be started.
2. Universal Respiratory precautions: Realization of transmission risk through droplets and aerosolization has prompted coining of term "Universal respiratory precautions" and its widespread implementation among HCP.⁽¹²⁾ This new term is coined on the lines of universal precautions that came into play for HIV, HBsAg and HCV infections.
3. Dedicated COVID ORs/ infected OR: A separate OR for suspect or COVID positive patients and all ORs to have proper places for donning, doffing and bath. Proper training of all OR personnel as per guidelines.
4. Air conditioning: Negative pressure AC systems for COVID OR's preferable but since most of the facilities lack negative pressure,

the COVID OR can have standalone room air-conditioners that recirculate air within a single occupied zone. Outdoor air intake through slightly open windows and exhaust by natural exfiltration or exhaust fans should be kept operational alongside.⁽¹³⁾

- Surgical Triaging: We will find ourselves looking for non-surgical treatments/lesser invasive procedures requiring lesser post-operative downtime or hospital stay while constantly checking our reserves for personnel (Anesthetist/ Surgeons/ Nurses/ support staff), supplies, PPE, blood products, ICU beds, non-ICU beds. Plan the OR list according to staff and estimated surgical time for each case keeping in mind slightly more time would be needed at each step given the new scenario.
- Patient transfer and decontamination of OR and instruments: Keep time for OR sanitization in between cases and shorten recovery area stay.

COVID-19 Surgical and anesthesia care plan

Pre-operative:

- rRT PCR (real time reverse transcription polymerase chain reaction) test

Figure 1: Pre-operative COVID Testing

- Revised pre-operative assessment guidelines: If the patient has a history of COVID infection, detailed history of COVID infection including ICU admission, ventilatory support should be sought. Reassessment of patient health status just prior to surgery to look for sequelae is mandatory.
- COVID sequelae and optimization: Detailed assessment of cardiopulmonary status of the patient to rule out pulmonary fibrosis or cardiac arrhythmia which need optimization pre operatively.

Immediate pre-operative:

- Validity of pre surgical negative test reports varies as per institutional policies, however ICMR recommends a maximum of 7 days provided the patient is isolated during this period.⁽¹⁴⁾
- Revised anesthesia checklist to include COVID questions
 - COVID consent
 - Saturation and temperature screening
 - Patients should wear a cap, surgical/ N 95 mask in all OR areas.

Intraoperative:

- Revised OT protocol for infection prevention and control
 - Use of PPE by all personnel in all areas of patient care.
 - Minimal equipment and personnel in OR.
 - Restrict the number of people in the OR especially during aerosol generating procedures like intubation and extubation, surgical drilling, cautery and laparoscopic surgeries.
 - Methods to curtail spread of infection through aerosolization in the OR
 - No open circuit/ Bains circuit for general anesthesia.
 - Total intravenous anesthesia preferred over inhalational anesthesia.
 - Avoid high flow nasal oxygenation, nebulization, supraglottic airway devices
 - Revised intubation guidelines for COVID. Rapid sequence intubation with cricoid pressure, Deeper plane for intubation to avoid bucking use of video laryngoscope for intubation.
 - Extubation at a deeper plane, antiemetics and I.V. lignocaine prior to extubation. Avoid maneuvers that induce coughing.
- Anesthesia machine modification as per ISA advisory for Covid-19

OR: 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. These HME filters can remove up to 99% of airborne particles of size 0.3 microns or greater, thus helping in preventing contamination of OR atmosphere. Apply a third HMEF on tracheal tube itself, if feasible. Corrugated tubing can be applied to the scavenging port and that can be dipped in a bucket with 1% hypochlorite solution. Attach HMEF filter to the tracheal tube immediately after inflating the cuff.

- Open surgeries preferred over laparoscopic surgeries. Bronchoscopy and GI endoscopies are better avoided.

Post-operative

Decontamination of all surfaces, screens, keyboard, cables, monitors, anesthesia machine and enough air exchanges, after each surgery. The agents used in decontamination are hydrogen peroxide spray disinfection (through vaporized hydrogen peroxide generator (VHPG), 1% sodium hypochlorite solution, or 75% alcohol wiping of solid surfaces of the equipment and floor. All floors and walls to be cleaned with 1% sodium hypochlorite solution Before starting the decontamination, the staff has to remove the outer hand gloves and doff in the designated doffing area.

Discard breathing circuit, mask, tracheal tube, HME filters, gas sampling line and soda lime after every surgery. Water trap to be changed if it becomes potentially contaminated

All surgical linen and dressings, markers, etc. are to be discarded.

Thus, enough time between two cases (approximately one hour) is advocated. Seal all used airway equipment in a double zip-locked plastic bag. It must then be removed for decontamination and disinfection.

The metallic equipment to be kept in 1% sodium hypochlorite solution for half an hour. They are then washed and wiped clean. They are subsequently put in instrument boxes and covered with plastic bags. The surfaces of passageways and the elevator should also be cleaned with sodium hypochlorite and alcohol.

Post discharge care

Ensure safety and proper follow up facility for all patients in case of known or suspected adverse outcome.

Expanding surgical capacity by transitioning to outpatient care, encouraging telemedicine for preoperative consultations and post-operative care wherever possible. Special surgical navigators or dedicated teams to improve OR efficacy by meticulous planning and time management would go a long way in implementation of a complete surgical plan for restarting elective surgeries.

CONCLUSION

COVID-19 pandemic crisis has engulfed the whole world and posed a huge challenge for healthcare providers across the world. As of 17 th September 5.12 million cases in India and still counting. In India too all the elective surgical sub-specialties had to take a backseat initially. With better knowledge about the disease and systems in place to control its spread, we are now ready to venture into re-starting elective surgical work. Modification of infrastructure and processes, judicious use of PPE and taking utmost care to protect the health care professionals and the surgical patients is mandatory. Careful planning by a dedicated team of surgeon, anesthetists, hospital administration, OR personnel can successfully address the necessary changes for restarting elective surgical work. A gradual guarded resumption of surgeries may be possible for hospitals in districts labelled as green zones and caution for the other zones. Policies should be periodically reviewed as per local guidelines.

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