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Review Article

COVID-19 patients and surgical recommendations in low-resource settings

Bappy Basak[1]*, M. Tasdik Hasan[2], Rifat Alam[3], Raiiq Ridwan[4], Imran Kais[5], Shailendra Kurmi[6], M. Nur Hossain Bhuiyan[7], S. M. Quamrul Akther[3]

[1]Department of A&E, Global Specialized Hospital, Mirpur-1, Dhaka-1216, Bangladesh
[2]Department of Psychological Sciences, University of Liverpool, United Kingdom
[3]Department of Surgery, Shaheed Suhrawardy Medical College and Hospital, Sher-e-Bangla Nagar, Dhaka, Bangladesh
[4]Department of Emergency Medicine, Cambridge University Hospitals NHS Foundation Trust, United Kingdom
[5]Department of General Surgery, West Middlesex University Hospital, London, United Kingdom
[6]Department of Emergency and ICU, Himal Hospital Pvt. Ltd, Ganeshwor, Kathmandu, Nepal
[7]Department of Surgery, Chittagong Medical College and Hospital, Chittagong, Bangladesh

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***Correspondence:**
Dr. Bappy Basak,
E-mail: tonmoybasakbappi@gmail.com

ABSTRACT

COVID-19 infection has made a great impact on the health and economy of many countries. Low middle-income countries are yet to experience the worst of it. There are lots of issues, such as, appropriate resource management that will come alongside the infection that can make the condition even worse. For how long this virus will stay with us is yet to be known. In the situation, whole surgical management cannot be postponed for a longer period that can damage the patient's health. There are lots of queries that will also come up with the viral infection, for example, how should we use our limited test kits, when should we use PPE and which one, how should we select surgical cases, how to ensure proper post-operative care, and another vital question how can we protect health workers from getting infected while giving the service. We have made a bunch of recommendations for such countries to ensure proper preparation against this pandemic. These considerations can ensure the highest care for the patients with surgical conditions and also guarantee maximum protection of the health care teams from admission to operation, operation to ward, and ward to discharge.

Keywords: Surgical indication, surgical management, COVID-19 patients, Bangladesh, LMICs

INTRODUCTION

COVID-19 epidemic has shaken the whole world immensely. Even the best health care systems are struggling to fight with this condition in terms of management, resources and manpower. Many first world countries have already seen the surge and in the upcoming weeks and less-developed countries like Bangladesh, Nepal, and India are about to experience a peak in the number of cases. It is of utmost importance that necessary steps are taken before the surge of patients. Less availability of diagnostic kits, less manpower and minimal logistic supports including PPE are going to be the burden in this battle against this epidemic.[1] These recommendations are made addressing all these concerns to support the patients with surgical conditions while being COVID-19 positive or at risk of having COVID-19 to ensure the best outcomes for the patients, doctors, nurses and other health care providers.

Recommendation for general management, routine open and laparoscopic surgeries, emergency surgeries, the operation theatre and post-operative management are given bellow.

CONSIDERATIONS FOR GENERAL MANAGEMENT

All patients with respiratory problems should be separated including suspected COVID-19 patients. This separation should initially be between those with respiratory problems and other cases. Once test results are known, positive cases should be taken to the negative-pressure isolation ward.[2]

All non-essential hospital or office staff should stay at home and telework.[3] Visiting should be cancelled.[3]

Urgent discharge of inpatients who are medically fit to leave and to create some more spaces anticipating the worse scenario.[2]

Necessary meetings should be arranged virtually.[3]

General wards and extra operation theaters can be used as critical care ward to support more patients.[4] Moreover, purchasing extra capacity at private hospitals to ensure more staff and facilities available for urgent surgery, including operating theatres, their beds, and ventilators for COVID-19 patients.[2]

During breaks, staff should stay in different rooms and if in the same room should maintain at least one-meter distance and not more than 15 minutes in the same room.[5]

Ensuring urgent training for health care providers in following areas: Contact tracing, Surveillance data analysis, Case management and patient transportation, Risk communication, Specimen collection and transport, Disinfection and hazardous waste management, and Donning and doffing PPE.[1]

Training on which PPE should be used when and where is also essential to make proper use of limited resources.[6]

CONSIDERATIONS FOR ROUTINE OPEN AND LAPAROSCOPIC SURGERIES

All routine operations should be delayed depending on the local, regional and national response to the disease. This delay will free up hospital capacity for patients requiring more urgent treatment. [2-4]

A Surgical Review Committee, composed of surgeon, anesthesiologist, and nurse (sometime oncologist in cancer patients) is essential to make transparent and appropriate decisions in patent's best interest.[7]

Operations and procedures should be considered if delaying these is likely to extend the hospital stay, increase chances of readmission, or harm to the patient.[8] The decisions should be made balancing risk and benefit.[7]

Considering as only elective surgery cases, cases should not be postponed rather than needs to be selected in line with the 'Elective surgery acuity scale'.[9]

Patients unresponsive to medical management of a surgical condition should also be considered for surgery to decrease the future use of resources.[8]

Consent discussion with all patients including the risk of COVID-19 exposure and the its consequences.[3]

All patients who will be undergoing surgery should be tested for COVID-19 irrespective of respiratory symptoms to ensure maximum protection for the health care team and other patients.[10]

Appropriate precautions should be taken for using diathermy, ERCP or other endoscopic procedures and managing airways in patients with COVID-19 infection as it should be considered an aerosol generating procedure.[3]

Laparoscopic procedures could be aerosolizing as well, thus carrying risk of transmission of COVID-19. Where possible, these procedures should be deferred, and if urgent or emergency, for consideration of open procedures. All attempts should be made to exclude COVID-19 prior to a laparoscopic procedure. In cases where laparoscopic procedure is the only option with a high benefit to risk ratio, appropriate PPE is essential to minimize risk to operating theatre staff.[3]

CO_2 ventilation and pneumoperitoneum pressure need to be set at minimal possible levels without compromising proper surgical field exposure.[10]

The power settings of electrocautery should also be as low as possible. Avoid long dissection on the same spot by electrocautery or ultrasonic scalpels to reduce the surgical smoke. Special attention is warranted to avoid sharp injury or damage of protective equipment, in particular gloves and body protection.[10] Smoke evacuator should be used in electrocautery.[6]

CONSIDERATIONS FOR EMERGENCY SURGERIES

All surgical cases should be considered as COVID-19 positive unless proved otherwise. If readily available, they should be tested pre-operatively for COVID-19.[10]

In a suspected or confirmed case of COVID-19, non-operative management is preferable if safe for the patients.[8] If operation is required in these patients, appropriate PPE should be used including disposable gloves, disposable plastic apron, disposable fluid-

resistant gown (risk assess), fluid resistant mask (type IIR), eye/face protection.[11]

Patients requiring emergency surgery should pass through different triages. A primary triage before admission to the hospital whereas secondary triage before entering the operating room should be done by anesthesiologists, including reviewing history, physical examination, and reviewing the chest computed tomography and/or chest x-ray. The body temperature should be retaken. Individuals who are negative of COVID-19 infection should undergo the surgical procedure normally if the surgery is urgent or emergent.[12]

Patients with suspected or confirmed infection with the virus identified in a nondedicated hospital for COVID-19 must be reported to the respected authority and transferred to a dedicated hospital provided the patient is stable for transfer.[12]

Where possible chest imaging should be done along with abdominal imaging.

CONSIDERATIONS IN THE OPERATION THEATRE

A dedicated operating room only for patients with COVID-19 must be separated with a clear notification as "infectious surgery" outside the door.[13] A dedicated surgery team including anesthesiologists is only allowed to enter the operating room.[12] No one should come out of the room before the operation is finished. Team members should be kept as minimal as possible.[13]

The functionality of the theater must be confirmed by technical personnel including the functional high-efficiency filter and the appropriate operation of laminar flow.[12]

The theater needs to be well prepared with a negative pressure system.[6] If negative pressure operating rooms are unavailable, operations can be done cautiously with the positive pressure system with a high air exchange cycle rate (>25 cycles/h), however; air conditioners must be turned off.[12,13]

A dedicated anesthesia machine must be ensured in the operating room. There is a lack of a consensus for disinfection of the machine before it can be used for noninfected patients.[12] Epidural or spinal anesthesia should be considered if feasible and safe for the patients.

Surgeons and other team members not needed for intubation should wait outside the operating room until anesthesia induction and intubation are completed for patients with or suspected of COVID-19 infection.[6]

Surgical equipment used in the operation for COVID-19 positive or suspected cases should be cleaned separately from other surgical equipment.[12]

CONSIDERATIONS FOR THE POST-OPERATIVE MANAGEMENT

If a positive or suspected COVID-19 patient is stable after surgery, the patient should be directly sent back to the negative-pressure ward not to the post-operative room once extubation is completed in the operating room.[12]

During shifting, the dedicated personnel should wear proper personal protective equipment outside the operating room. This should be not be the same as worn during the procedure.[6] The patient should be covered with one disposable operating sheet and then taken to the isolation ward through a dedicated passage. During transfer, the patient must wear a surgical mask or N95 mask. The passageways should be properly cleaned and covered.[12]

If the patient needs to be kept incubated, a single-patient-use respiratory bag must be used during shifting. Ventilator is not recommended during the transfer.[12]

CONCLUSION

As the strongest health sectors are trying to cope with the scarcity of resources in this situation, it is not surprising that the less developed and developing countries will have a lot of drawbacks on top of its economical inferiority. The goal should be towards making the best use of available resources. Therefore, these recommendations are to manage the manpower at its best and make the appropriate use of limited supports including PPE, hospital beds and test kits so that countries are prepared enough to deal with this pandemic situation ensuring care and protection for everyone in Bangladesh and similar low resource settings.

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