Recommendations for Surgical Interventions during COVID-19 Pandemic

COVİD-19 Pandemisi sürecinde uygulanacak cerrahi girişimlere yönelik öneriler

Alp Yıldız¹, Mehmet Çetinkaya², Sezai Leventoğlu³, Alpaslan Şenköyülü⁴

¹ Yıldırım Beyazit University Yenimahalle Research and Training Hospital, Department of General Surgery, Ankara, Turkey
² Stellenbosch University Tygerberg Academic Hospital, Department of Spinal Unit of Orthopaedics, Western Cape, South Africa
³ Gazi University Faculty of Medicine, Department of General Surgery, Ankara, Turkey
⁴ Gazi University Faculty of Medicine, Department of Orthopaedics and Traumatology, Ankara, Turkey

ABSTRACT

Throughout human history, many pandemics have broken out and caused great numbers of deaths. As the technological development made quite a huge advancement by the twentieth century, the medical treatment armamentarium had widened its facilities and resources. This brought with sophisticated and competent health care services for people which provided the medical practitioners with higher success rates when fighting against diseases and improved recovery and survival rates. However, during the COVID-19 pandemic, the high transmission rate of the novel SARS-Cov-2 virus has led to the paralysis of the health system and running out of the resources and healthcare workers. Thus, local government healthcare service regulators have begun building up plans to create management algorithms to use the limited resources more efficiently. This paper presents preliminary practical instructions for healthcare providers as a basic foundation for COVID-19 and potential future pandemics.

Key Words: COVID-19, pandemic, general surgery, surgical considerations, orthopaedics and traumatology

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ÖZET

İnsanlık tarihi boyunca çok sayıda salgın ortaya çıkılmış ve pek çok ölüme neden olmuştur. 20. Yüzyılda teknolojik gelişmelerde büyük ilerlemeler olmasya birlikte tıbbi tedavi usług ve araç kaynakları ve imkanları da genişledi. Bu durum insanların için sofistike ve yetkin sağlık hizmetini getirdi ve sağlık çalışanlarının hastalıklarla mücadelede yüksek başarı oranları ve daha iyi sağaltı ve sağkalım oranları elde etmelerini sağladı. Fakat, COVID-19 salgını sırasında, yeni tip SARS-Cov-2 virüsüne yüksek hız saığlık sistemini felç etti ve kaynakların ve sağlık çalışanlarının yetersiz kalmasına neden oldu. Bu yüzden yerel sağlık hizmetleri düzenleyicileri sınırlı miktarındaki kaynakları daha etkin bir şekilde kullanabilmek için yönetim algoritmasi oluştururma planları yapmaya başladılar. Bu makalede sağlık hizmeti sunanlar için temel oluşturacak öncül pratik öneriler vermektedir.

Anahtar Sözcükler: COVID-19, pandemi, genel cerrahi, cerrahi değerlendirme, ortopedi ve travmatoloji

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ORCID IDs: A.Y. 0000-0002-6800-138x, M.Ç. 0000-0002-7131-4280,S.L. 0000-0003-0680-0589, A.Ş. 0000-0001-6870-5515

Address for Correspondence / Yazışma Adresi: Sezai Leventoğlu, MD Çayyolu Lotus Sitesi Prof. Dr. Ahmet Taner Köşkülü Mahallesi 2873. Sok. B2 Blok No.3 06810 Çankaya, Ankara, Turkey E-mail: sleventoglu@gazi.edu.tr

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INTRODUCTION

In China at December 2019, number of patients admitted to the hospital with viral pneumonia later revealed that caused by the novel coronavirus disease (COVID-19-19) (1). The COVID-19 epidemic has become a pandemic very fast. As 4th of May 2020 3.435.894 cases confirmed and 239 604 people died due to COVID-19 disease. First final reports of Wuhan shows surveillance as a very optimal working strategy on keeping down the spread (1-3). Healthcare workers have a very huge risk of contamination as working on the front line of patient care due to enhance exposure with virus. A very direct cause of this contamination mainly consists of personal protective equipments (PPE) (1,4). To this date thousands of healthcare professionals have been infected worldwide (1,5-7).

These data showed the importance of providing and appropriate using of PPE’s on disease transmission control and infection control guides are highly important to restrain and bring under control the infection among healthcare professionals. Even though surgery is not a management method of the disease, several numbers of infections dispersed from operating theaters in China (1,5). The purpose of this review is to bring forward recommendations to surgeons and other healthcare professionals who participate the perioperative care. These recommendations are reviewed from some of the authors’ practices and various COVID-19 guidelines for health professionals as listed in the references section. Nowadays the urgent concern of all counties must be prevention of healthcare professionals from the disease to ensure continuous healthcare service (1).

Decision Making for Surgery

As a respond to this very difficult dilemma, American College of Surgeons (8,9) released a statement that indicates: “Each hospital, health system, and surgeon should thoughtfully review all scheduled elective procedures with a plan to minimize, postpone, or cancel electively scheduled operations, endoscopies, or other invasive procedures until we have passed the predicted infection point in the exposure graph and can be confident that our health care infrastructure can support a potentially rapid and overwhelming up tick in critical patient care needs.” (8,9).

Several countries have now suspended all elective procedures including diagnostic interventions (10). Especially ambulatory surgery trusts (AST) which perform outpatient surgical interventions have closed or appeased their services. Yet AST’s not very essential or only could serve as front-line patient assessment hospitals in need of support, there is a huge need for urgent surgical procedures (8,10). Like many others, in our country health system managed this course with a minimum series of surgery patients consisted of emergency surgery or cancer surgery mostly. Surgical case types must be stratified by indication and urgency (8).

Patient Transport and Preoperative Features

Transport of patient to the theatre must be as fast as possible (11). A direct access of the operation rooms must be provided by the directory and must be controlled by local infection disease committee to reduce the spread risk of infection. If transport will occur inside the hospital or between different hospitals, a designated vehicle must be used for this purpose (9-11). The healthcare worker responsible for transportation must be appropriately educated and must be actively using PPEs which consists of hand gloves, cap, protective mask, apron, glasses and face protective barrier (8,9,11). A Bioccontainment device must be provided may be utilized. All workers must wear PPEs at any stage of perioperative process (11,12).

The highest protection level should be applied when suspected patient or a COVID-19 confirmed patient is encountered in any precautions should be taken to enhance maximum security on protecting the staff from spread like N95/FFP2-3 mask, face protective barrier, hand gloves, apron and protective footwear (12-15). Healthcare workers must be careful about hand sanitation before and after surgical procedures (12,13,16). Because these workers are very tend to cross-infect their families, it is very important to screen healthcare professionals’ health status regarding body temperature and any other possible symptoms to diagnose and isolate the person from social relations and patients (12-16).

Anesthesia

Even though the decision depends on the clinical scenario, an optimal anesthetic approach should have been applied to reduce aerosol-producing procedures during general anesthesia (GA), like ambulatory ventilation, airway suctioning, and endotracheal intubation (17). On 2002 SARS outbreak, endotracheal intubation has found to be the strongest independent risk factor for super-spreading nosocomial infections which affect many healthcare workers in China (17-18). In the light of this information, very strict considerations which has been taken for airway management of confirmed/suspected COVID-19 patients may help reducing operation theatre spread (17,19-21).

Preferring regional anesthesia (RA) techniques can be useful regarding reduced pain and opioid consumption, postoperative pulmonary complications, postoperative nausea and vomiting (17,22,23) and when avoidance of patient coughing and infecting the team by aerosol dissemination considered, RA seems to be preferred option depending on these various main advantages (17,26-28). Additionally, RA has fewer effects on pulmonary function in accordance with GA which is thought to extenuate postoperative pulmonary complications in COVID-19 patients who already have restricted respiratory function (17-29).

Intraoperative Considerations

A negative pressure operating theatre should be used in case of existence of a patient with COVID-19 (or highly suspected) in addition to all PPE which mentioned before (12). Surgeons and all related staff must be remonstrated to avoid blood and body secretions at the time of surgery, all PPEs must be kept clean of those particles (12,30-32). Aerosol producing procedures cannot be described as just intubation or extubation but all general surgery procedures, gastrointestinal endoscopy, laparoscopy, and the use of energy devices (e.g. electrocautery) included (12,30-32). If electrocautery or other energy devices use is essential, the device must be adjusted to the lowest effective power to minimize surgical smoke, and use a smoke suction (32,33).

Laparoscopic/Robotic Surgery

The overall risk is thought to be lower on open surgery as no artificial pneumoperitoneum is incurred though when laparoscopic procedures performing, the risk of aerosol production is greater during insertion, and removal of trocars from a pressurized peritoneal cavity (34,35). On the other hand, robotic surgery presents some highly protective advantages as Finley et.al described as:

• Highest protection level III for bedside assistant, but level II for console surgeon
  • Reduce the number of staffs in the operation room.
  • Ensure safe and effective gas evacuation.
  • Reduce the intra-abdominal pressure to 8 mmHg or below.
  • Minimize electrocautery power and avoid the use of ultrasonic sealing devices.
  • Surgeons should avoid contact outside the theater (both in and out of the hospital)” (34-36).

Lifesaving Cancer Surgery

Canadian Partnership Against Cancer (36) recently released a statement that “Lifesaving cancer surgeries need to be managed appropriately during the COVID-19 pandemic”. They summarized their collective advice starting with the cancer surgeries must been put at last to delay or cancel, and the optimal choice would be transferring the patient any other hospital where the required procedure can be done. When delay cannot be avoided it must have been stratified by the clinical prioritization criteria and when the pandemic is over these patients would be the first to take care of (36).

Orthopaedic and Traumatology Interventions

The regulation of the orthopaedic consultation during the COVID-19 pandemic should be handled in four basic subjects; clinical consultation, surgical intervention, follow-up, and postoperative rehabilitation. Since there is no active referral system currently in Turkey, any curtailment in the number of presented patients for clinical consultation is not available. However, patients seeking medical care has been extremely decreased already as the patients themselves decided not to refer hospitals as far as possible. Moreover, by planning the rotation of the consultants every 2 weeks (since the incubation period lasts up to 14 days), exposure to COVID-19 and viral load can be kept under critical levels, thus back up healthcare providers protected from the virus at their homes can be kept ready to substitute the ones with confirmed/suspected COVID-19 infection.
As far as the resources are available, some urgent elective cases can be performed during the pandemic. These cases should rather be primarily the time-dependent ones like developmental hip dysplasia, progressing congenital foot deformities (such as club foot and rocker bottom foot), progressing varus or vagus knee deformities, congenital rapidly progressing or other early-onset spinal deformities, etc. The common feature of these disorders is that if the surgical intervention is postponed, the surgical indication may potentially and frequently change or even be no longer feasible. Similarly, impending fractures secondary to tumor metastasis of long bones or loose implants of prosthetic replacement of joints may be the secondary level elective cases to be performed during the pandemic. However, these secondary level patients can also be postponed with strict protective measures. As the pandemic measures are gradually repealed, yielded elective caseload should be structured as is the above-mentioned manner which can be followed by severely debilitating disorders and those with best outcomes to use the limited time and resources during the normalizing period. However, despite satisfactory outcomes, chronic degenerative disorders, nonunion/malunion/delayed union, adult deformities, aseptic implant loosening, etc., must follow the semi-urgent cases like avascular necrosis/osteochondral defects, debilitating joint ligamentous injuries, spinal stenosis, etc.

**CONCLUSION**

The COVID-19 pandemic has caught most of the countries off-guard. Several countries exposed either SARS-CoV or MERS-CoV outbreak previously were somewhat better prepared and aware of what was coming. The current paper and the subsequent works will hopefully enlighten the healthcare providers on how to manage the disaster if any pandemic breaks out in the future. In that regard, we strongly recommend collaborative decision-making, planning, and management by multidisciplinary regularities.

**Conflict of interest**

No conflict of interest was declared by the authors.

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**Table 1:** Theatre setting for the COVID-19 positive or suspected patients

| Theatre setting for the COVID-19 positive or suspected patients |
|---------------------------------------------------------------|
| **A specific theatre at a rather different floor reserved for these patients** |
| The material used in the theatre should rather be of disposable material, such as disposable mask, caps, scrubs, footwear coverings. |
| **Minimization of the personnel entering the room** |
| Negative pressure operating room rather than positive pressure operating room |
| Using a different pathway for the patient from the healthcare providers |
| Buffer and clean zones protecting the surgical armamentarium and keeping away the surgical team from the clean zone |
| **Another buffer zone for surgical team to remove the disposable material and to sanitize** |
| Taking shower before leaving the theatres. |
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