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Pitfalls Encountered during Anesthetic Care of First Surgical Case of COVID-19 at a University Hospital

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Abstract

With the rapid surge of SARS-CoV-2 cases, institutions had to quickly adapt to address proper management of this novel virus. With many unknowns, interprofessional relationships in the hospital were strained. This case exemplifies nursing and physician staff concerns and how these were addressed during management of the first COVID+ patient requiring surgery at our institution: a 54-year-old male with insulin-dependent type 2 diabetes mellitus (IDDM), morbid obesity, COVID positive (COVID+) status with productive cough and oxygen requirement scheduled for extensive right lower extremity debridement under general anesthesia. We will emphasize learning points in communication between floor nursing staff, operating room (OR) nursing and physician staff, and the interdisciplinary challenges faced.

Keywords: COVID-19, Perioperative, Surgical protocol

Abbreviations: IDDM: Insulin-Dependent Type 2 Diabetes Mellitus, COVID+: COVID Positive, OR: Operating Room, PPE: Personal Protective Equipment, PAPR: Powered Air Purifying Respirator, PACU: Post Anesthesia Care Unit, ICU: Intensive Care Unit

Case Description

A 54-year-old male with IDDM, morbid obesity, COVID+ status with productive cough was scheduled for extensive right lower extremity debridement under general anesthesia. Given that it was the first COVID+ patient requiring surgery at our institution, a multi-disciplinary meeting and discussion was held to address potential risk factors and safe management of the case. A preoperative protocol was developed, ensuring proper personal protective equipment (PPE) attire with N95 and eye protection or Powered Air Purifying Respirator (PAPR), gown, gloves, shoe coverings as well as three extra staff to assist with donning and doffing to minimize risk of exposure and contamination with staff involved. Despite having formulated a general plan, tensions arose among staff members as the case progressed regarding the nuances revolving around the appropriate level of protection and involvement by each staff member caring for the patient.

The preoperative and intraoperative course were rather uneventful, as team members carefully outlined and followed protocols discussed, such as minimizing staff in OR during aerosolizing procedure such as intubation/extubation, maintaining respiratory droplet and contact precautions at all times, minimizing staff breaks, and proper disposal of contaminated materials. However, after successful extubation and recovery in the OR to bypass the post anesthesia care unit (PACU), the patient was to be transferred directly back to his room by anesthesia staff. For transfer, the patient was placed on a nonrebreather facemask with an overlying mask, and the anesthesia transport team continued the use of their PPE worn in the OR, other than switching gloves to adequately protect transferring personnel while being mindful of conserving resources. After returning the patient to his designated room, anesthesia staff then removed shoe covering, gown, gloves, and washed hands while keeping on the worn PAPRs.

After the case, it was later discovered that an incident report had been filed against the anesthesia transport personnel due to wearing of the PAPRs and certain PPE during transfer from the OR to the patient room. The floor nursing staff had filed the report, stating the protocol for transferring for COVID+ patients to/from OR was to not wear their now contaminated N95/PAPR, and instead a surgical mask. Additionally, concerns were expressed regarding the gowns and shoe coverings which were also considered to be contaminated which were also worn for

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transfer. Due to concerns by anesthesia transport staff with an actively coughing patient in a recently extubated state while maintaining contact and close proximity during transfer of the patient, the PAPR and remainder of PPE were left on due to concern of safety. Transporting staff observed that the nurse caring for the patient on the floor was not wearing a gown or eye protection, but only a N95 mask and gloves but no gown. It was also later palpable the distress from the floor nurses that the transferring team seemed to have been offered much more protection and PPE than the resources provided for nurses on the floor, while the nurses felt they were equally as exposed to close contact and potentially COVID while providing care for the patient.

The case was later reviewed by the hospital committee and interdisciplinary teams involved. Nursing staff brought to attention that it did not seem just that anesthesia transport staff were provided PAPRs while nursing staff were only provided N95s with a limited supply and/or surgical masks only. Due to limited resources at the time of the event and the uncertainty of the magnitude of the rising number of COVID cases in the region, hospital staff made the decision to revise the protocol to address these concerns.

Discussion

During the SARS-CoV-2 pandemic, new challenges have arisen for medical institutions in how institutions manage surgical patients peri-operatively. According to recent literature, human-to-human transmission of COVID-19 usually occurs via droplet or contamination of a surface [1]. Viral particles can remain on surfaces for several days, and there is evidence to suggest that COVID-19 can survive for 3 days on surfaces such as plastic and steel [2]. As experts in the perioperative arena, anesthesiologists are positioned to be leaders in the management of surgical patients before, during, and after surgery. At our University Hospital, new preoperative, intraoperative, and postoperative protocols were established when the institution encountered its first COVID+ patient. These guidelines were made in conjunction with surgical, anesthesia, and nursing staff to address the obstacles we encountered with our patient.

Before taking the patient back to the operating room, we recognized the need for a team huddle with anesthesia and nursing staff prior to patient transport. During this huddle, a discussion of the patient's pertinent history and COVID+ status is confirmed. Identifying the roles of each member of the transport team is important to minimize exposure to COVID. Assigning proper roles limits exposure to COVID by ensuring that only a specific number of staff members are in contact with the patient and these staff members have access to the necessary PPE. Proper PPE includes a fit-tested N95 or higher level respiratory barrier, disposable caps, face shield, goggles, fluid-resistant gown, gloves, and shoe covers [3]. While performing any sort of aerosolizing procedure such as intubation or extubation, the operating room should be cleared of unnecessary staff [4]. Once the aerosolizing procedure is performed, staff should wait at least 10 minutes before re-entering the operating room. For COVID+ patients, general anesthesia is preferred to decrease the risk of aerosolization through coughing and bucking [5]. Rocuronium should be used instead of succinylcholine to maintain muscle relaxation and to minimize the occurrence of coughing [4]. Intubation should be performed as a rapid sequence induction due to the increased risk of aerosolization during bag valve mask ventilation [3,6]. Preoxygenation for 5 minutes with 100% oxygen is preferred [4]. Video laryngoscope is preferred for oral intubation to decrease the probability of intubation failure [5]. It is also recommended to double glove during intubation, and dispose of the outer gloves after intubation has been accomplished [5].

After anesthesia induction and successful intubation, precautions should be taken during the operation. In this case, both anesthesia staff and nursing staff continued to wear proper PPE that included a gown, N95 mask, face shield, and gloves. The surgical team continued to wear proper sterile surgical attire with the addition of an N95 mask underneath a surgical mask. During the operation, the surgical team requested equipment that was not present in the room. This required additional nursing staff to retrieve equipment from the sterile and substerile rooms, resulting in possible exposure to the virus.

Postoperatively, the patient was extubated and recovered in the operating room, bypassing the PACU [6]. During extubation, Greenland notes that dexmedetomidine, lidocaine, or remifentanil should be considered to decrease the risk of coughing [4]. According to recommendations made by multiple sources, postoperative patients should be recovered in the intensive care unit (ICU) or hospital floor and should not be transported to the PACU [3,6]. In this case, our patient was recovered in the OR and transported to an isolated hospital room after extubation, in agreement with these guidelines.

During patient transport, guidelines by Tang LY, *et al.* indicate that the transport team should wear PPE outside the OR. Masks should be worn regardless of patient intubation status, and the patient should wear either a surgical mask or N95 [3]. In our case, when the patient was transported to his room, the transport team wore the same PPE that they wore in the operating room. This was done to conserve PPE. Initially, the protocol for hospital transport of COVID+ patients stated that adequate PPE

consisted of gown, gloves, surgical mask, eye protection, but not a N95. When the patient arrived on the floor, an Incident Report was filed by the floor team and the transport team was told by the nursing manager that anesthesia staff should have disposed of the contaminated PPE prior to the patient arrival. After patient transport, a multidisciplinary team was established to evaluate the existing protocol. Preventing contamination of the transport route and floor was an important point, but protecting transport staff and conserving the PPE were also legitimate concerns. In balancing these two needs, the multidisciplinary team determined that since transmission of COVID from PPE was less common, conservation of PPE was more important. In addition, the transport team would wear N95 masks during transport and the receiving team would also wear proper PPE. This required effective communication between teams to adequately prepare for the patient transport, as well as coordination by the OR nurse manager to establish a preoperative huddle, with the anesthesia, nursing, as well as surgery teams present.

This case exemplifies the varying opinions and challenges of balancing the maintenance of adequate personal protection, minimizing further contamination and spread, while minimizing waste and preserving resources as much as possible. Each of the team members demonstrated differences in priorities and concerns regarding the management of the COVID patient given they were involved in different aspects of the patient's care. Due to these constraints, the importance and need of a systematic, dedicated method of communication among interdisciplinary teams including but not limited to OR nursing, floor nursing, anesthesia providers, and surgical team members was brought to our attention. Especially in the setting with rapidly evolving and new information regarding this virus, protocols should be regularly updated and clear communication and consensus among all involved staff members is imperative.

The utilization of the incident reporting system filed against the anesthesia team demonstrated benefits of quickly leading to responsive changes by hospital administration to address the concern. This ultimately led to the rapid development of a new, revised protocol regarding adequate PPE wear by all involved staff after reviewing the hospital's available resources and COVID case burden. However, this reporting did increase tension among interdisciplinary teams, and could be seen as a 'pointing fingers' approach rather than collaboratively and constructively formulating plans for improving safety and refining protocols. As physicians and often team leaders, we should strive to address concerns by ancillary staff as they arise and promote open, constructive communication to help resolve any issues as they arise in the workplace. Now more than ever, we should encourage open discussion regarding concerns about employee safety in the workplace revolving around this virus, as we deeply rely on feedback and input from all front-line workers. By sharing different perspectives, we are able to better gauge their considerations on how to better optimize containment and treatment of COVID patients at their local institutions. As in the example of the novel COVID surgical case at our institution, the friction amongst healthcare workers ultimately lead to positive changes and revision of protocol to improve patient as well as provider safety in the workplace.

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References

1. Huang C, Wang Y, Li X, Ren L, Zhao J (2020) Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. The Lancet 395: 497-506.
2. Doremalen NV, Bushmaker T, Morris DH, Holbrook MG, Gamble A (2020) Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. New England Journal of Medicine 382: 1564-1567.
3. Tang LY, Wang J (2020) Anesthesia and COVID-19: What We Should Know and What We Should Do. Seminars in Cardiothoracic and Vascular Anesthesia 24: 127-137.
4. Greenland JR, Michelow, MD, Wang, L, London MJ (2020) COVID-19 Infection: Implications for Perioperative and Critical Care Physicians. Anesthesiology 132: 1346-1361.
5. Chen X, Liu Y, Gong Y, Guo X, Zuo M (2020) Perioperative Management of Patients Infected with the Novel Coronavirus: Recommendation from the Joint Task Force of the Chinese Society of Anesthesiology and the Chinese Association of Anesthesiologists. Anesthesiology 132: 1307-1316.
6. Tang G, Chan AKM (2020) Perioperative management of suspected/confirmed cases of COVID-19. Anaesthesia.