

Anesthesia Management in Cesarean Section for Close Contact Parturient with COVID-19 Patient: A Case Report

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ABSTRACT— *During the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbreak, which produced a disease that had been termed COVID-19, safely treating patients that have contracted COVID-19 has become a very challenging problem for both patients and healthcare workers alike.*

The case we will be dealing with concerns a surgery of a full-term parturient who tested negative for COVID-19 at the time of surgery but had been living with a husband who contracted COVID-19. The parturient was taken up for an elective caesarean section under spinal anesthesia in an isolated operating room.

It is necessary to consider how to manage the patient who was a close contact even if their COVID-19 test result is negative and how to set up the protocols to protect healthcare workers themselves in such situation.

Keywords--- COVID-19, Caesarean section, Parturient, Spinal anesthesia

1. INTRODUCTION

Since the outbreak of COVID-19, there are still patients who continue to need surgical treatment, as well as healthcare workers that should treat them at close proximity. In the ongoing COVID-19 pandemic, the COVID-19 patients who need surgery are increasing as well.

Some patients have negative results in the real-time reverse-transcriptase polymerase chain reaction (RT-PCR) test, but sometimes infection is still highly suspected considering their history of contact with the COVID-19 patients. When these patients get surgery, the healthcare workers need to protect themselves from the possibility of a positive result on the COVID-19 test a later time.

In this case, we describe a case of the parturient undergoing cesarean section, who was a close contact to a COVID-19 patient but got a negative result at the RT-PCR test at the time of surgery.

2. CASE

Our case is that of a 40-year-old parturient, American Society of Anesthesiologists (ASA) grade 2, primigravida, with a pregnancy of 35 weeks 0 days. The patient was in contact with her COVID-19 positive husband 3 days prior and was admitted to an isolation room in the hospital. The parturient had to undergo a cesarean section due to preterm labor and her bicornuate uterus. Her COVID-19 RT-PCR test result was negative, and there were no other specific symptoms of a COVID-19 infection at the time. She was in very close contact with her husband, and there was still a risk of false negative on RT-PCR test. As a result, healthcare workers decided to undertake the procedure with Level 3 Personal Protective Equipment (PPE).

In the patient's preoperative chest x-ray, there were no active lesions, and she had a normal sinus rhythm in electrocardiogram (ECG). The laboratory investigations were within normal limits.

While wearing a KF-94 mask, the parturient was transported to the Operating Room (OR) through a controlled access corridor. The OR was isolated from main operating rooms, and all healthcare workers participating in the surgery wore Level 3 PPE.

In the OR, routine monitoring was applied to the parturient such as noninvasive blood pressure (NIBP) every 5 minutes, ECG, and SpO₂. We consistently made sure KF-94 mask of the parturient was on at all times. We planned to do spinal

anesthesia, and made sure to also prepare for general anesthesia with a video laryngoscope as a backup plan.

The initial vital signs, 141/77-88-17-37.2°C, were stable. A 0.5% bupivacaine heavy 9 mg, which was mixed with epinephrine 200 mcg and fentanyl 25 mcg, was injected intrathecal.

When reaching block level, T4, the parturient developed hypotension, and began complaining about having nausea. She responded to IV phenylephrine 100 mcg and 5 mg of IV ephedrine. Her vital signs stabilized within the normal range, and remained stable until the end of the surgery. The operation started 15 minutes after a spinal anesthesia and a healthy baby was born 6 minutes later after the start of surgery. The baby was then immediately transported to the isolation room.

The parturient was still so nauseous that she had to be given 0.3 mg of IV antiemetics, Nausea (Ramosetron), and 5 mg of ephedrine more.

As the operation came to an end, we gave her IV antiemetics, palonosetron (Aloxi 0.075 mg). The parturient was transferred to the isolation room while wearing a KF-94 mask.

After the day of surgery, the parturient and the baby got a COVID-19 RT-PCR test daily until postoperative day (POD) 3, and the results turned out all negative. They were discharged from the hospital on POD 5 without any complications.

3. DISCUSSION

The basic reproductive number, R_0 , which is defined as the average number of secondary cases one case would produce in a completely susceptible population [1], of COVID-19 is as high as about 2.68 (95% Credible Interval 2.47–2.86) [2] and people who are close contacts are so susceptible that it is hard to avoid infection. The suspected patient of COVID-19 infection needs to be tested for COVID-19 via the real-time RT-PCR. However, the false negative rate of real-time RT-PCR is about 9.3% [3] due to low amounts of SARS-CoV-2 virus concentrations in the incubation period, which is approximately 5.2 days. [4] The parturient real-time RT-PCR result was negative, however, we could not exclude the possibility of the false negative.

The operating theater is designed for the positive pressure room to make any airborne particle that originates in the room to be filtered out. [5] However, a negative pressure room is ideal to prevent dissemination of pathogen from aerosol generating procedures such as intubation or extubation, especially in surgery of COVID-19 patients. [6] Our hospital has an isolated OR, which is designated for the operation of COVID-19 positive patients. Unfortunately, this OR was not designed for negative pressure. In order to make it fit for use, the air conditioning system which exhaust indoor air out and make outdoor air in was modified to let only indoor air out. By removing the indoor air, the operating room was maintained as negative pressure transiently.

When managing a patient with confirmed or suspected infection, the healthcare workers should prioritize on protecting themselves from the infection of the SARS-CoV-2. To protect from droplet and to avoid contact, we followed the recommendation of Anesthesia Patient Safety Foundation (APSF) and applied N95 mask or other respirator (eg, a powered air-purifying respirator [PAPR]), a face shield, an impermeable fluid resistant gown, disposable head cover, protective footwear, and 2 sets of gloves. [7]

These PPE could result in diminished visibility and tactile perception leading to an increase in a possibility of failure for spinal anesthesia. For general anesthesia, given that a term pregnant patient is expected to have difficult airway, it is recommended to prepare a video laryngoscope to avoid difficult intubation. [8] It also increases the distance between healthcare worker's face and the patient's airway, which may minimize the risk of infection. [9] Therefore, we prepared general anesthesia with video laryngoscope in case of that failure.

To protect healthcare workers from the aerosol generated by the parturient, we tried to minimize any unnecessary manipulation of the parturient airways. To achieve this, we did not allow the patient to take off her KF-94 mask and did not put her on an oxygen mask. We anticipated that her oxygen saturation would be well maintained due to the fact that she did not have any respiratory symptoms and underlying diseases. In addition, we did not give her any additional sedative drugs to avoid respiratory depression. The parturient was kept in awake, and the oxygen saturation was maintained in normal limit, as we expected.

Likewise, to minimize aerosol generation, we planned to do spinal anesthesia rather than general anesthesia. The SARS-CoV-2 spreads as aerosols or droplets between people who are in close contact with each other, within 1 meter. [10] Airway management could expose a lot of aerosol particles to healthcare workers, especially during tracheal extubation. [11] Though there is a report that spinal anesthesia could carry the risk of introducing the virus from blood or tissues into the cerebrospinal fluid [12], there is another report that the risk of causing meningitis or encephalitis is extremely low with neuraxial block procedure, even in infected patients. [13] There was no bleeding tendency - coagulation lab and platelet count of the parturient within normal range, so there were no contraindications to do spinal anesthesia.

We had set an anesthetic goal to administer spinal anesthesia successfully and safely until the end of the cesarean

section. We were able to achieve our goal maintaining hemodynamic stability of the patient and protecting the parturient, the baby, and healthcare workers.

4. CONCLUSION

AS the SARS-CoV-2 pandemic continues to persist, healthcare workers cannot fully avoid treating a patient with confirmed or suspected COVID-19 infection. It is necessary to prepare a protocol to protect the patients and healthcare workers who are involved in that procedure.

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