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Correspondence

Perioperative management of COVID 19 patients undergoing coronary artery bypass surgery

Dear Editor:

The pandemic caused by the coronavirus disease 2019 (COVID-19) placed the health care system worldwide under great pressure. Certain facilities were forced to postpone elective surgical procedures when the severity of the pandemic increased [1]. The high contiguity of COVID-19 placed the cardiac surgery societies in a position to release guiding documents aiming at practitioner's exposure risk reduction and adequate resources allocation.

We are reporting three COVID-19 positive cases, without respiratory symptoms, that were diagnosed to have critical coronary artery disease underwent urgent coronary surgery to highlight the key points in their perioperative management. The project was by the Hamad medical corporation center, (IRB MRC 04-20-586).

The complexity in the decision to operate on urgent basis on patient with a recent diagnosis of COVID-19 came from the novelty of the disease and limited abilities to define its impact on cardiothoracic surgical outcome. Our experience with three such patients represents pragmatic decision to operate. The apparent respiratory system stability of these patients encouraged our team to give priority to manage their acute coronary syndrome (ACS) to limit the possible mortality and morbidity.

Our institute elected to do reverse transcription polymerase chain reaction (RT-PCR) from nasopharyngeal swab test for all patients presenting with ACS. Patients were considered to be COVID positive (unless proved otherwise by testing) and practitioners coming in contact with such patients used personal protective equipment (PPE). It is imperative that ACS should be managed without waiting for COVID-19 test results [2].

In our center we sat a multidisciplinary meeting before deciding to operate on COVID-19 positive patients. The contagious time for COVID-19 patients, who are asymptomatic and remain positive, plus the possible effects of cardiopulmonary bypass on patients who are supposedly active are currently unknown; therefore, they undergo management as infectious and active and it was settled to operate on and to care for these patients in full PPE [3]. The anatomical complexity of the coronary lesions in our three patients made surgery the only hopeful solution.

We designated one operating room in our facility to receive COVID-19 positive. We prepared a flow chart for team guidance (Fig. 1). In our three patients, anesthesia induction was carried out after 5 min facemask pre-oxygenation, by rapid sequence intubation (RSI) technique. Endotracheal intubation was done by video-laryngoscopy utilizing apneic technique without manual ventilation. Peng and Hota suggested that apneic intubation technique confers highest success probability for COVID-19 patients [4].

We asked the ICU team to receive the patient form the theatre door to minimize PPE exhaustion and to limit staff mobility in contaminated PPE. Treatment was carried out with a transport ventilator and minimum team. Patel and colleagues raised the importance of minimizing ventilator circuit disconnection, reducing staff attendance and ventilator transport [5].

Safety of COVID-19 patients transport needs to be customized in each institute. We transfer positive cases to a specific unit, which has negative-pressure rooms with additional HEPA filters. Lung protective strategy, early thromboembolic prophylaxis and extubation in a protected atmosphere were followed. None of our patients exhibited early complications and were discharged from the ICU after an average of 24 h after surgery.

We followed up our patients routinely, like all other post-cardiac surgical patients, with special attention to the early complications we already highlighted. We screened our exposed practitioners routinely after 3 days by COVID-19 IgM-IgG Rapid Test “BioMedomics, USA” or if they experience symptoms related to COVID-19 infection by RT-PCR.

1. Conclusion

In our case series we did not experience worsening of the patients' clinical condition due to COVID-19 association. None of the health care providers attending to the patients endured cross infection. These results need to be confirmed in further trials.

Abbreviations

| Abbreviation | Meaning |
|--------------|---------|
| CAD          | coronary artery disease |
| CABG         | coronary artery bypass graft |
| COVID-19     | coronavirus disease 2019 |
| CTICU        | cardiothoracic intensive care unit |
| PPE          | personal protective equipment |
| SARS-CoV-2   | acute respiratory syndrome coronavirus-2 |
| NSTEMI       | Non-ST segment elevation myocardial infarction |

CRediT authorship contribution statement

BS: study design, contribution to the concepts, writing the manuscript and revising the final form. AK: critical revision, CC: patients' s enrollment; ASG: writing and manuscript revision; SS: data management and manuscript revision, HE data collection, SE data management, cases review. All authors read and approved the final manuscript.

Declaration of competing interest

The authors declare that they have no competing interests.

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**Availability of data and materials**

The data related to this manuscript and to its conclusions are available in the Hamad medical corporation medical research center. The data is available on request to the corresponding author Dr. Amr Salah Omar by e-mail: a_s_omar@yahoo.com, after approval from the medical research center.

**Consent for publication**

Not applicable.

**Ethics approval and consent to participate**

This study was approved by medical research center in Hamad Medical Corporation. The ethical committee in Hamad medical corporation approved the study (reference number MRC 04-20-586), informed consent was waived by the ethical review panel for all patients enrolled in the study. However, all study data were maintained anonymously.

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