Impact of COVID-19 Pandemic on Catheterization Laboratories: Bahrain Experience

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BACKGROUND

On December 31, 2019, a report to the World Health Organization from Wuhan city confirmed that a novel coronavirus (COVID-19) was behind an outbreak of severe respiratory illness in China.[1] COVID-19 has hit pandemic pitch since March 2020, and many reports thereafter confirmed that mortality and morbidity from COVID-19 were significantly high among patients with established cardiovascular disease and those who sustained cardiac injury in the context of COVID-19.[2]

The virus was verified to have reached the Kingdom of Bahrain on February 21, 2020.[3] As of August 8, 2020, there have been 43,629 confirmed cases, of which 40,549 have recovered and 161 have died. The number of tests conducted totaled 892,926.[3]

In view of the immense demand for medical personnel, hospital beds, and associated medical facilities, particularly the intensive care unit, temporary redistribution and reorganization of resources within our health-care system have become necessary, with relevant consequences for all medical specialties. The redistribution of health-care resources has perhaps affected access to emergency treatment, including reperfusion therapy, depending on the severity of the epidemic at the local level and has further aggravated the situation, given patients’ fear of seeking medical attention during the pandemic.

We thought of sharing our experience in Mohammed Bin Khalifa Catheterization Laboratories during the pandemic, with the fact that it is the only full-service cath lab in our kingdom rendering the management of interventional cases, particularly in emergency settings, extremely challenging. This was particularly the case with our team, which came to grips with the ethical conundrum on how to prioritize access to irreplaceable catheterization laboratories regarding the provision of timely management care for suspected (sometimes confirmed) COVID-19 cardiac cases, while not compromising essential cardiac care for non-COVID-19 patients.

The dilemma was also in how to balance all this with the safety of the cardiac center workforce that had been strengthened over the years to comprise, under one roof, a team of top-ranked and highly qualified invasive and noninvasive cardiologists, cardiac surgeons, and cardiac anesthetists, supported by highly skilled technicians and nursing staff.

Our main concern was how to tackle primary percutaneous coronary intervention and other cardiac emergencies in patients with unknown COVID-19 status that would normally have resulted in a trip to the lab.

TIMELINE

The management of cardiac cases was influenced by the phases of the pandemic and events in Bahrain, and we were reacting, and modifying our plans, enlightened by the recommendations of The National Taskforce for Combating the Coronavirus.[3,4] The timeline of COVID-19 pandemic in Bahrain is shown in Figure 1.

CATHETERIZATION LABORATORIES AND COVID-19

The challenges concerning COVID-19 are enormous because they confront us all – physicians, health-care systems, patients, and the public. It is worth emphasizing...
that our measures were a bit stricter than expected in view of multiple implications of bringing a COVID-positive patient to the lab for the rest of the staff, lab flow (i.e., one of the available two rooms would be offline for several hours for fumigation). The Mohammed bin Khalifa Catheterization Laboratories is the only tertiary cardiac center in Bahrain. It handles referrals of advanced cardiac cases, especially those that require surgical or percutaneous coronary intervention which cannot be managed by any other hospital in Bahrain. Temporary suspension of its services helped limit the spread of COVID 19.

We encountered three phases of the pandemic since COVID-19 reached our kingdom: the initial outbreak followed by the peak and postpeak periods. At the time of writing this article, we were looking forward to the last phase, the new normal. The summary of cath lab plans during different phases of the pandemic is depicted in Figure 2.

The following additional measures were applied:

- Homestay of all nonimperative personnel
- Culprit-lesion-only percutaneous interventions
- Steer clear of simultaneous exposure of Healthcare personnel (HCP) sharing unique skills
- If COVID-19 status is unknown, the patient should wear a surgical mask and HCP should wear full personal protective equipment (PPE), including a respirator with a rating N95 or higher, full-face shield or goggles, disposable caps, long-sleeved fluid-repellent gowns, surgical gloves, and shoe covers, during the entire procedure
To ensure efficacy and adequate training of our HCP on proper techniques for donning and doffing PPE and to minimize the time needed to don the full protective gear, we filmed an instructive movie clip to ensure that all staff members are well versed with the available PPE equipment [still images from MKCC donning and doffing instructional movie are depicted in Figure 3]

If possible, cath lab procedures on patients with known or suspected COVID-19 should be done near the end of the day so as to minimize delays caused by terminal cleaning along with restrictions confining procedures on patients with known COVID-19 to a single lab

- Low threshold was ensured for intubation and connection to closed-loop ventilation before transfer to the cath lab to avoid emergent intubation during the procedure
- Risk of patients’ transfer was minimized with the encouragement of bedside procedures (e.g., Swan-Ganz catheter, pericardiocentesis, temporary pacemaker insertion, and intra-aortic balloon pump)
- Teleconsultation was conducted before and after cath lab procedures with home delivery of medications to avoid unnecessary movement of the patients to and from the cardiac center.

We believe that the utmost goal of our cath lab is to deliver essential cardiac interventions in a timely manner without undermining the safety of the patients or staff members. We worked hand in glove with administration to implement protocols on how to secure HCP and manage patients who are COVID-19 positive or under investigation. Finally, we must maintain a mindset that inevitably, COVID-19 patients are going to come through the lab, but on the other hand, we must protect the only full-service cath lab in our beloved Kingdom of Bahrain.

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