

Interventional Radiology Roadmaps for Covid-19 Pandemic: an Italian Experience

Abstract

Italy is the first country where the Covid-19 outbreak took hold in Europe. In a dramatic scenario, Interventional Radiology departments are undergoing important changes in the logistics and organization of daily workflow to be ready to play an active role in the optimal health care of both Covid-19 and non-Covid-19 patients. We briefly describe the safety measures taken at a tertiary Italian center in Milan to meet these goals, ranging from optimal vetting, set-up of dedicated spaces, optimization of the workflow and staff management.

Opinion

Since 21st February 2020, when an Italian 78-year old man lost his life due to the Covid-19 infection, Italy has registered 4032 deaths over 47021 positive cases at the time of writing. One month before, First reports from Wuhan, where the virus SARS-Cov-2 first emerged, had already declared that the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbreak was going to become an international emergency of public concern. Italy is the first country where the Covid-19 outbreak took hold in Europe. A few days after the first deadly case, Italy started deploying tight security measures, including massive lockdowns and social distancing[1] to try to flatten the epidemic curve and allow the Health Care System to get ready for the emergency. In this dramatic scenario, Italian Interventional Radiology (IR) services are undergoing some important changes in the department logistics and organization of daily activities to get ready to play an active role in the optimal health care of both Covid-19 and non-Covid-19 patients. Treasuring the experience of the SARS epidemic back in 2003[2], we aim to briefly describe the safety measures taken at the Humanitas University Hospital, a tertiary Italian center located in Milan, to meet these

goals, ranging from optimal vetting, set-up of dedicated spaces, optimization of the workflow and staff management.

Shortly after the state of emergency, a multidisciplinary team devised institutional SARS-Cov-2-control guidelines to guarantee the safety for both operators and patients during interventional procedures.

1. All the healthcare professionals involved in the IR department received specific training regarding safety measures both through an Institutional e-learning platform and training sessions in small groups. Counseling and psychological services were also established by the Hospital to assist staff exposed to risk of infection.
2. Personal protective devices were available when facing a suspicious or confirmed Covid-19 patient. For the IR operator, they comprise double sterile gloves, Ffp2/3 masks, adhering mask for eye protection, non-sterile waterproof gown and sterile surgical gown. Surgical masks were mandatory during all the activities for every worker.
3. All patients with a scheduled procedure were screened using rigorous vetting of suspected SARS-CoV-2 infections. Staff were asked to refrain from unnecessary travel as advised by the Italian Ministry of Health.
4. All medical congresses were postponed and participation to multidisciplinary boards was allowed for a single professional only for each discipline; a webcam service was established to allow participation of the whole board.
5. The CT scan located in the emergency department was dedicated exclusively to COVID-19 patients. Being the interventional radiology division located in a separate area of the hospital, this helped to reduce the risk of in-hospital transmission.
6. The lack of anesthesiology professionals, coping with the increasing influx of COVID-19 patients, along with the limited availability of blood and blood components and the increase of turnaround time between the procedures to accommodate infection

prevention measures, obliged to reduce elective procedures giving priorities to urgent oncologic procedures. Emergency interventions, i.e. embolization for acute trauma and stroke, continued as normal.

7. US-guided procedures performed at the bedside under local anesthesia are favoured. Pleural drainages might be critical to improve ventilation in case of pleural effusion, a rare hallmark of Covid-19 but common among Covid-19 oncologic patients. In cases requiring case of anesthesiology support, a dedicated, negative-pressure room should be used.
8. An operating room equipped with C-arm, with a negative pressure environment to provide high-frequency air changes (25 per hr) and thus rapidly reduce viral load was set-up in an isolated Covid-19 ward to perform both surgical, interventional radiology and hemodynamics procedures. Such an operating room had its own ventilation system with an integrated particulate air (HEPA) filter and only one possible route for entry/exit via the scrub room. New workflows were created for activation and use of the designated isolation OR. Sufficient amounts of drugs, fluids, and other equipment were prepared in the operating room before surgery, while every unnecessary equipment was moved out to the filter area. We used disposable equipment whenever possible,
9. The number of professionals involved in the procedures was reduced to a minimum. No observers, residents or students were allowed to enter the angiographic suite or the dedicated negative-pressure operating room. Signs were hung on the doors to remember the mandatory use of surgical masks and to prevent unauthorized staff from gaining access to the area. Residents' working schedule was temporarily halved.
10. Systematic checks of temperatures for all staff were taken twice daily using hospital-issued digital thermometers. If inadequate personal protective equipment was worn at the time of close contact, the staff member was taken off duty while an infectious diseases team assessed the risk of transmission.

Similar recommendations for surgical procedures and anesthesiology support have also been recently given in other epidemic areas[3]. In this dramatic situation that Europe is now experiencing and the United States is starting to face, a well-established coordination with radiographers, nurses, and other allied health staff is critical to achieve the required safety measures to contain the pandemic outbreak. Although IR is not at the forefront of the emergency [4], it can provide relevant contribution to the management of Covid-19 patients by harmonizing its services with the Hospital's compelling needs. In particular, IR needs to coordinate carefully with the anesthesiology staff to identify beforehand the optimal environment for each image-guided procedure. IR must be ready to play an active role in the Covid-19 emergency and once more highlight its clinically-oriented, responsive and collaborative nature.

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