Surgical perspectives and patways in an emergency department during the COVID-19 pandemic

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Abstract

The spread of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), declared a pandemic by the World Health Organization (WHO),1 triggered a global response to preparedness in health systems worldwide. It was March 2020 when the Italian Government implemented extraordinary measures to limit viral transmission such as restricting the movement of citizens, promoting physical distancing and banning social activities, unless strictly required. Hence, the Italian national health system suggested a reorganization in order to optimize already existing resources and implement them to overcome the crisis caused by the pandemic.

Careggi University Hospital, high specialty hospital and HUB for Trauma in Tuscany, reorganized all activities and adopted several measures in order to optimize the health response to the pandemic, including:

-the suspension of the elective non-oncological general surgical activity in order to guarantee priority access for surgical cancer patients and ensure a redistribution of hospitalization areas into COVID-19 pathways and Non-COVID-19 pathways;

-the remodelling of non-urgent outpatient activities, guaranteeing reservations only for post-surgical evaluations or surgical visits deemed urgent, non-deferrable, or reserved for oncological patients. In this regard, the possibility of carrying out a remote digital examination, via a dedicated platform which records all activities, has been envisaged;

-the execution of the oropharyngeal (OP) swab 48 hours before the elective hospitalization for patients with neoplastic pathologies who need scheduled surgery, or for patients who need to perform invasive procedures;

-limitation of access for carers and visitors, except for procedures involving minors where the presence of at least one parent is required;

-the body temperature measurement with body-temperature scanners, providing a surgical mask for those without it and the disinfection of hands with hydroalcoholic gel for anyone entering the hospital, including employees;

-the postponement of all internal and open training events within the hospital;

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the suspension of meetings that require the presence of multiple professionals, replacing them with video conferences or rescheduling them after the pandemic

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banning the presence in the hospital of volunteers or trainees for educational/training purposes;

-the communication of news regarding the state of health of patients to designated family members performed by telephone, daily, or in case of changes in the clinical status (need for surgery, outcome of surgery, post-operative course, etc.).

Over 100 years have already elapsed since the foundation of the Careggi University Hospital, and despite the continuous restorations and the hospital building dynamics that led to a complete redistribution of care activities over the years, one thing has not changed, the fact that it was, and still is, a pavilion hospital. The same spirit that inspired the construction of the hospital with pavilions, today is evidence of the efficacy precisely as it enables a more effective response to the pandemic. The only limit is the increase in access points, which are present in all individual pavilions and not the presence of one single access point. In this regard, in each pavilion there is a check point where an operator measures body temperature, provides the masks and invites the disinfection of hands with an hydroalcoholic gel.

Our pavilion, the DEA (Emergency and Reception Department) pavilion, which includes the activities related to the emergency and urgency as a whole, has been remodelled in order to allow an adequate response to the pandemic in progress such as enhancing the number of beds in the intensive care unit, the increasing of sub-intensive care units and the remodulation of the DEA into differentiated COVID-19 and Non-COVID-19 wards.

At the beginning of the introduction of social distancing measures and the beginning of lockdown, we noticed a reduction in the inflow of surgical patients in urgency, which lasted approximately 15 days. Subsequently, there was a gradual resumption of surgical activity in urgency until reaching the previous standard activity. Conversely, the emergency surgical activity related to traumatic

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pathology has undergone to a sharp reduction due to the lockdown measures imposed by the government with the limitation of people's movement.

Our hospital follows standardized procedures in order to homogenize behaviors, precisely in the management of emergencies. In the event of surgery, COVID-19 confirmed patients are transferred from a dedicated area of the Emergency Department (ED) to a dedicated COVID-19 Operating Theater (OT) by a specific transfer pathway. The entire OT team is equipped with full Personal Protection Equipment (PPE); numerically surgeons, nurses, anaesthetists are limited to the minimum required staff to perform surgery. Moreover, changes of personnel are limited until the end of the procedure in order to involve the least number of operators. A filter area is provided at the entrance to the COVID-19 Operating Theater where all the necessary PPE are available. All the clinical and essential patient's documentation is consulted and updated outside the OT after removing the PPE and performing the disinfection of hands. The doors of the OT are kept closed during operation and any supply of material to the OT is carried out by personnel with PPE, present outside the dedicated OT.

In addition, all the recommendations reported by SAGES2 and the American College of Surgeons3 regarding the use of electrocautery, ultrasonic scalpels and the risk of transmission by aerosol during laparoscopy were provided. In our experience, all cases were treated via exploratory laparotomy. In COVID-19 confirmed patients, it is important to consider the time that elapses between the disposition for urgent surgical intervention and the preparation of the OT and the protection of all OT staff. In addition, the use of complete PPE makes the surgery non-comfortable due to perspiration or fogging of the goggles and the implementation of the recommendations that reduce energy devices to a minimum make the intervention technically challenging.

According to the precautionary principle, every patient undergoing emergency surgery not already tested for COVID-19, must be considered as potentially infected, an issue that entails putting into practice of all precautions. This principle of safety for all healthcare professionals obviously translates into implementing all the provisions used in confirmed COVID-19 patients for surgical interventions that are not postponable and that require the immediate availability of the operating room (such as trauma, shock, bleeding, suicide attempts, peritonitis, etc).

Still on the same precautionary principle, patients with negative swab for COVID-19 but suspected pulmonary radiological picture for COVID-19 should be treated in any case as COVID-19 positive patients and, very often, waiting for a second swab or for a BAL examination is not always possible.

Patients with potential surgical disease, not COVID-19-like, but not yet tested for COVID-19 should be considered as potentially infected until the outcome of the swab. Obviously it would be preferable to perform the surgery knowing that the swab is negative in order to serenely perform surgery using all the surgical energy devices, the laparoscopic approach and not wearing complete and uncomfortable PPE. Of course, this entails some specific issues, especially regarding surgical indications and the decision-making process. For less significant surgical pathologies, such as appendicitis, cholecystitis, diverticulitis (excluding the forms associated with general peritonitis) and potential surgical intervention that can be deferred by a few hours (waiting for the swab) it must be considered that the time that elapses between the execution of the swab and the response of the swab must not change the treatment strategy. In fact, in order keep stress factors mitigated within the team, many surgeons may be tempted to abandon the surgical strategy in favour of conservative treatments. The risk of undertaking a conservative treatment, with the consequent discharges of the patient and re-admission after a few days for the same pathology for a worsening of symptoms (and subsequent new swab at entry), is high and must be taken into consideration. In our opinion, the surgical response should be the same as before the COVID-19 era.

Patients with a negative swab for COVID-19 who require surgery undertake the "clean" pathway with dedicated operating rooms and the possibility of hospitalization in the Covid-free surgical ward. The problem may be the time between the patient admission, performing the swab, the surgical consultation, the outcome of the swab and the activation of the OT. In our hospital a pathway for a rapid evaluation of the swab in this type of patients have been undertaken in order to optimize timing, reduce waiting time, and improve the surgical response.

These COVID-19 related problems have been addressed by surgeons all over the world and specific pathways have also been described4; yet, it should be considered that the hospital administration and the heads of departments must adjust their policies to international guidelines, national government measures, local data and resources.5

In conclusion, the pandemic has also increased surgical stress. In fact, as suggested by Diaz et al. surgeons have witnessed one of the most dramatic changes in their practices with rapidly decreasing numbers of elective surgeries.5 In our opinion, the interruption of the elective non-oncological surgery procedures may cause stress due to the discomfort that the postponement will cause to the patient, as well as the rescheduling which the surgeon will have to organize at the earliest convenience.

Furthermore, also the relations between the doctor and the

patient and between the doctor and the patient's family members may be impaired due to the different approach which a telephone contact represents, instead of the face-to-face contact. If we consider also the apparent reduction/absence of polytrauma due to social distancing measures imposed by the government, a minor human contact in patient handover (even if digital platforms are provided) and the difficulties in the technical management of surgical COVID-19 patients in emergency settings, this pandemic era is further tempering the spirit of surgeons.

Moreover, it should be considered that, when the government containment measures will be discontinued, after two months of lockdown, we might assist to a "0–100" increase in polytraumas, and that the resumption of normal surgical activity and the increase in traumatic pathology will require additional resources to support surgery in emergency and trauma settings.