PROTOCOL OF ACCEPTANCE, EXECUTION AND MANAGEMENT OF POSITIVE COVID-19 PATIENT IN INTERVENTIONAL RADIOLOGY AT THE AORN SANT’ANNA AND SAN SEBASTIANO OF CASERTA

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ABSTRACT

The Covid-19 emergency required healthcare facilities to redesign the care pathways in order to avoid the spread of the pandemic.

Interventional Radiology which carries out an essential activity in a high specialty hospital environment is exposed at the forefront in all those minimally invasive diagnostic-therapeutic procedures in election and urgency. It was therefore necessary to apply, on the basis of the National, Regional and Company directives, a specific protocol to the patients belonging to the Hospital.

A series of procedures have therefore been applied, ranging from acceptance, preparation, pre and post-treatment interventional to reduce the infectious disease risk. However, this protocol is burdened by higher costs due to the increase in PPE to be used and the multiple disposable covers to be placed on screens, medical devices, worktops and angiography equipment.

Furthermore, considering the overall times of a procedure, therefore also including the sanitization times of the facilities and the room, there is an evident increase in the room engagement times and the technical difficulties, obviously all this in favor of the absence of infection of the operators.

EDUCATIONAL PURPOSE

The explosion at the Covid-19 epidemic which has also been present in Italy since January has forced the legislator and the Istituto Superiore di Sanità (ISS) to create diagnostic-therapeutic protocols in order to face the epidemic in hospital settings (1). These protocols are intended to ensure adequate health care for these patients and at the same time to protect the health of health professionals (2).

The Interventional Angio-Radiology service also had to adapt to the new structure required. Based on the Hospital Corporate Protocol dedicated to positive Covid-19 patients, in order to guarantee the protection of operators and the spread of the epidemic, a series of measures in Interventional Radiology have been implemented in order to avoid contamination.

INTRODUCTION

Severe acute coronavirus 19 respiratory syndrome (SARS-COVID-19) requires necessary hospitalization in intensive or sub-intensive care units (3). These hospitalizations are due to the need to provide adequate respiratory support to the patient as well as therapy, still not standardized, for the eradication of the infection (4).

Although interventional radiology (IR) is not directly involved in the treatment of these patients, it remains an important part of the healthcare system. Our Interventional Angio-Radiology UOSD has in fact continued its activity, guaranteeing both election and emergency services, non-deferred oncological treatments and organ rescue procedures, even in Covid-19 positive patients.

In this circumstance, it was decided to implement safety protocols for patient access and management. We have been able to treat, in biological safety, Covid-19 positive patients avoiding nosocomial spreads (5,6).

The procedures we have adopted have complied with the directives indicated by the Health Department and the Risk Management of our Hospital.

MATERIALI E METODI

The angiography room provided at our hospital’s Interventional Radiology is equipped with an environmental ventilation system similar to the operating rooms; in particular, a continuous exchange of ambi-
ent air is guaranteed with a vertical air flow suction system of 12-15 exchanges of ambient air per hour, so as to limit air contamination as much as possible. The angiographic device is a Philips Allura FD20 with 3D radiological imaging capability through rotational scanning and exported to 3D-RA for subsequent analysis, room monitor size 55”, patient-holding table with dimensions of 303x205x36 mm.

All non-essential and mobile equipment must be moved out of the angiography room to avoid possible contamination. Before the patient’s arrival, all the aids that must be present in the room, such as the patient table, the serving trolleys and the angiographic equipment, are appropriately harnessed by transparent plastic protections or by celofan film removable at the end procedure (Fig. 1).

The medical, nursing and technical staff involved, in addition to the normal anti-X devices, also wears personal protective equipment (PPE), even before the patient arrives. The PPE supplied consists of gloves, mask, sterile disposable waterproof gown, visor and high shoe covers. These devices are already normally in use at Interventional Angio-Radiology, being part of the dressing materials normally used. An exception is the surgical template which in these surroundings is replaced by those without valve FFP2 or FFP3. Respirator type CATO EDITION of the DRAGER, rigorously supplied with disposable devices such as: respiratory circuit, anti-bacterial / viral filter, catheter maunt, cannula guedel face mask, tracheal tube with cap, laryngoscope with disposable blade (fig. 2).

The patient is prepared at the ward by wearing a cap, surgical mask and gown. Informed consent is sent to the patient, who reads, approves and signs in the presence of the ward doctor at his / her hospital bed before being transported to the angiography room. Before carrying out patient handling, transport operators also wear appropriate PPE.

Objectives of the analysis of the processes described (7): Ensure the delivery of a safe surgical performance for the patient; Minimize the exposure of operators to the risk of contagion; Reduce contamination of the operating room environments. Before the patient arrives in the angiography room:

The nursing pool, before transport to the patient’s room, must:

Define with the anesthesiologist and surgeons the strategies to be adopted for the patient; Verify that the consensus, anesthesiological and interventional, have been signed; Check for any patient allergies; Carry out a check-list to check the operating room and all electromedical devices; If it is not possible to obtain and intervene on the pressure, set the ventilation to at least 25 volumes of air / h; - Prepare all surfaces by protecting them with transparent film or plastic; Set up intubation trolley with difficult intubation forecast; Set up the operating tables and all the complementary material that can be foreseen for the surgical procedure; Remove all non-essential objects and electromedical equipment in the radiological room; Prefer disposable material; - Minimize travel to and from the operating room by leaving a single access; Provide a nurse outside the operating room for any supplies: the latter will control the flows to and from the operating room; - The whole surgical team wears PPE according to the procedure.

DURING SURGERY
Close all the access doors to the operating room, identifying the one to be used in case of need for procurement and / or any equipment; this passage of material and tools is guaranteed by a communication door with double steel door Fig. 3. Avoid staff leaving the operating room; Only the surgical team must be present inside the room; Avoid the exit of histological samples during the interventional procedure; Dispose of everything inside the operating room.

ENTRY OF THE PATIENT AND EXECUTION OF THE PROCEDURE IN INTERVENTIONAL ANGIO-RADIOLOGY
The patient enters directly into the angiography room without stopping in pre-anesthesia environments. All the pre-intervention nursing, anesthesiological and interventional procedures are carried out directly in the angiography room (venous, arterial access, CVC, IOT, monitoring, etc.).
After the preliminary preparation of the patient, the access door in the room is closed to reduce contamination outside the room and the personnel necessary to carry out the required procedure remain inside. Gloves are replaced by staff left in the room and angiography is carried out.

POST-PROCEDURAL PATIENT ASSISTANCE AND TRANSFER OF THE PATIENT TO THE WARD

The observation and awakening phase after the interventional procedure must always take place in the room. The patient still in the room is prepared for transfer to the post-intervention target unit by applying the surgical mask if not intubated. Only when these activities are completed is the entrance-exit door opened allowing the operators dedicated to transport to recover the patient. Once the patient is transferred, all the dedicated personnel remove the PPE inside the angiography room according to the procedure and dispose of it inside the same in special bags with indication of danger.

ENVIRONMENTAL SANITATION AND DISINFECTION

Both the disposable circuit of the respirator and the devices used for the control and aspiration of the airways are disposed of in waste containers cataloged and marked as biohazardous waste. The adequately protected cleaning staff starts the sanitization and disinfection process of the angiography room as required by the company protocols (8). The surfaces and medical devices are cleaned with an ammonium chloride or alcohol-based disinfectant product, ethyl alcohol 70 ° (9). Finally, the angiography room is cleaned with a sodium hypochlorite solution 1000 mg / l. At the end there is also an environmental vaporization with hydrogen peroxide.

RESULTS

Since February 2020, 150 procedures have been carried out in angiography rooms both in election and in urgency. Before being subjected to the interventional procedure, all patients performed swab in only 6 patients, it was positive and therefore the Covid path was followed.

The 4 Covid procedures were: 1 biliary drainage, 2 thoracentesis, 1 nephrostomy, 2 pleural drainages. After 48 hours from the first positive covid procedure, the angiography room staff carried out a buffer, which was repeated at 78 hours and subsequently after 20 days. None of the angiography room operators tested positive for Covid-19 infection.

DISCUSSION - CONCLUSIONS

This working protocol allows to reduce the time of stay of the positive Covid-19 patient at our interventional Angio-Radiology service in the pre-intervention phase allowing a reduction of the possibility of nosocomial contagion. The protocol adopted by us allows to guarantee all operators who interact with the patient suffering from sars-cov-19, adequate protection. The “dressing” and sanitization of the angiography room guarantee its reuse in complete safety. However, this protocol is burdened by higher costs due to the increase in PPE to be used and the multiple disposable covers to be placed on screens, medical devices, worktops and angiography equipment. In addition, considering the overall times of a procedure, therefore also including the sanitization times of the facilities and the room, it is clear that the room engagement times and technical difficulties increase.

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