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Letter from Italy

COVID-19 OUTBREAK IN NORTHERN ITALY: FIRST PRACTICAL INDICATIONS FOR RADIOTHERAPY DEPARTMENTS.

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INTRODUCTION

The number of people infected by COVID-19 is dramatically increasing worldwide [1]. The first person-to-person transmission in Italy was reported on February 21, 2020, and led to an infection chain that represents the largest outbreak outside Asia to date [2]. As of March 12, 2020, in Italy, there are 10,590 positive patients, 827 deaths, and 1,045 healed, with numbers varying from hour to hour. The COVID-19 incubation interval varies from 5 to 14 days [3]. Since January 30, 2020, WHO declared the COVID-19 outbreak a public health emergency of international concern, and the day after the Italian Government declared a public health emergency. In the first phase, the Government defined areas at different risk of infection: a) high-risk (so-called "red zone or level 1 risk zone" b) mean risk (level 2 risk zone) and c) the rest of national territory, to be alerted but considered at low risk (level 3 risk zone). In the subsequent phases of the crisis, following the indications of a scientific and technical committee and in agreement with the WHO, the Government finally decided to extend the Red Zone to the whole Nation (March 8, 2020). All public Hospitals faced an unprecedented emergency, with drastic changes in the organization. All cancer patients were consequently involved at different levels. We here report the experience of a group of Northern Italy Radiotherapy Departments that are located inside or very close to the first "Red Zone," and thus were the first to face the emergency. The main problem was how to continue the activity while protecting patients, families, and health professionals from the infection. The Authors virtually met with other Radiation oncologists (see acknowledgments) to share experiences and possible solutions that were defined according to the local and national health authorities' indications.

The indications we propose are structured as: a) definition of the priority, b) problem analysis, and c) suggested solutions.

PRIORITY 1: TO ENSURE RADIATION THERAPY DELIVERY TO CANCER PATIENTS

Problem analysis: Radiotherapy is a "life-saving" treatment and should be guaranteed to all cancer patients in which is indicated [4].

Suggested solutions: Regional and hospital management must ensure the full functioning of Italian radiotherapy facilities, even in emergency conditions.

PRIORITY 2: TO ENSURE SAFETY OF HEALTH PROFESSIONALS, PATIENTS, AND CAREGIVERS

Problem analysis: A widespread infection of the staff working in a radiotherapy facility would effectively result in the closure of part of the activities. Failure to identify the suspect or infected patients would increase the risk of spreading to operators and patients undergoing treatment.

Suggested solutions:

1. If a triage point at the entrance to the hospital has not been activated, the indication is to carry out a triage at the access of the radiotherapy department, to verify possible contacts with COVID-19 positive patients and evaluate suspect symptoms in all others (patients, caregivers) accessing the radiotherapy areas.
2. To provide a hydroalcoholic solution for hand disinfection at the entrance of the radiotherapy center.
3. To wear surgical masks, as recommended for all health professionals and patients according to WHO indications [5], and in particular in the following cases: 1) if the operator has respiratory symptoms, to protect others; 2) if the operator is in close contact with a person who has respiratory symptoms, to protect herself/himself.
4. To use sterile disposable overalls (tunic and trousers), sterile disposable gown, FFP2 masks, clogs, and overshoes when treating patients with suspect COVID-19 positivity, if they need to continue radiotherapy according to medical indications.

PRIORITY 3: MANAGEMENT OF COVID 19 SUSPECT OR POSITIVE PATIENTS

Problem analysis: We need practical guidelines on the appropriate behavior in case of symptomatic, suspect, or COVID-19 infected patients accessing radiotherapy facilities. The triage

evaluation should immediately report to the appropriate internal structures all patients who have symptoms possibly related to COVID-19 infection, according to existing regional regulations.

Suggested solutions:

1. If the patient has a cough or fever or dyspnea due to pre-existing morbidity: the patient should wear a protective mask, and radiotherapy should be continued.
2. If a new patient is COVID-19 positive: do not start treatment.
3. If a patient on treatment is suspect for the onset of COVID-19 typical symptoms (cough and/or fever and/or dyspnea) and is waiting for microbiological diagnosis: stop treatment. *
4. If a patient on treatment results COVID-19 positive and is symptomatic: discontinue treatment *
5. If a patient on treatment results COVID-19 positive but is asymptomatic: discontinue treatment*
6. If a patient resulted COVID-19 positive is declared healed by Infectious Disease Clinic: plan carefully to start or restart treatment according to clinical cancer condition

* Patients may continue treatment only in selected cases if their general medical conditions are not compromised by COVID-19 infection, if the oncological condition requires continuation of radiotherapy, if it is permitted by local health authorities, and with the use of adequate disposable protective equipment. We suggest personalized clinical assessment.

If possible, these patients should be treated at the end of the LINAC shift to limit the chances of infection for other patients.

After the treatment of positive patients (or patients waiting for diagnostic confirmation), the waiting and bunker areas should be sanitized at the end of the treatment session.

PRIORITY 4: STAFF RE-ORGANIZATION

Problem analysis: It is necessary to avoid the usual professional behavior that favors the aggregation of the professional figures working in the radiotherapy facility.

Suggested solutions: Medical, technical, nursing, and administrative staff must operate in separate areas, avoiding meetings that cannot ensure the safety distances required for prevention.

In case of infection of health professionals and therefore in case of a severe shortage of staff:

1. report the current situation to the hospital management, for getting help in solving the problem (e.g., hiring new staff);
2. connect with other radiotherapy centers for the use of external personnel to avoid the interruption of ongoing therapies;
3. call for service of retired personnel following the procedures already defined by the administrations;
4. redistribute patients on available machines, and a variation of fractionation, when feasible, is advised.

PRIORITY 5: REDUCTION OF PATIENTS' ACCESS TO RADIOTHERAPY FACILITIES

Problem analysis:

It is advisable to limit patient access to radiotherapy facilities while maintaining optimal care conditions.

Suggested solutions:

1. To adopt hypo-fractionated regimens when possible;
2. To postpone follow-up visits;
3. To use palliative medical treatments at home, instead of radiotherapy, when deemed to be of similar efficacy;
4. To delay non-urgent and deferrable radiotherapy treatments for patients with a better prognosis (e.g., adjuvant radiotherapy of breast cancer patients, radical radiotherapy of patients with low-intermediate risk prostate disease, others);
5. To postpone therapies for benign and functional diseases.

DISCUSSION

The COVID-19 spread in Italy was initially subtle, and then unexpectedly rapid in its expansion. Based on the information obtained from the Wuhan Region in China, it was initially thought to confine the outbreak areas while protecting the rest of the nation with lighter measures. As the first affected regions are characterized by a very high population density, the virus dramatically spread in a few weeks throughout Northern Italy. As a consequence, all cancer patients' therapeutic flows were altered: surgery, systemic therapies, and radiotherapy. The radiotherapy

centers located in the hospitals that were the first to face the emergency gained rapid field experience and then started monitoring the situation and collecting data. This report presents a few practical suggestions that came up from the first two weeks of collective work under emergency conditions and is the result of a joint effort to ensure continuity of therapies while protecting patients, health professionals, and the general population. The indications were integrated with the WHO recommendations and with the local health authorities' guidelines. The primary aim was to share information and provide guidance to radiotherapy departments worldwide. The report is mainly focused on how to deal with symptomatic, suspect, or COVID-19 positive patients undergoing radiation therapy. Since international indications for radiotherapy units facing COVID-19 outbreak have not been developed yet, we identified five key priorities, here described, together with a brief analysis of the problems and the possible solutions.

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