

Advances in Radiation Oncology
STAFF AND PATIENTS' PROTECTION IN RADIATION ONCOLOGY
DEPARTMENTS DURING COVID-19 PANDEMIC
--Manuscript Draft--

Manuscript Number:	ADVANCESRADONC-D-20-00148R1
Article Type:	Brief Opinion
Section/Category:	COVID-19
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Funding: none

Disclosure: none

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Since the onset of COVID-19 pandemic, researchers and clinicians in the radiation oncology sector have been paying attention to the supply of radiotherapy (RT) and the safeguard of patients, with regard to their infectious status. Based on the experience in two RT departments in Apulia (Brindisi and Barletta), we argue that the Italian guidelines currently in place are by far inadequate to ensure staff and patients safety and should be strengthened with urgency.

On March 11, the staff of the RT department of Brindisi was informed that three patients coming from medical oncology ward were found COVID19-positive. One of them had received RT treatment the previous month, on the 18th February, and it unclear whether, at that time, he was already COVID19-positive. Moreover, some Health Care Workers (HCW) from our staff met daily the other two patients between 2-6 March, without personal protection equipment (PPE). It should be noted that surgical masks for HCW in this department have been available only since March 9 (1); in another RT department (Barletta), PPE have been provided since March 10th (surgical mask and PPF2, cap, disposable gowns, glasses, gloves and shoe covers) and, since 14th March, visors and video training for the staff on the use of PPEs.

According to the guidelines of the Italian Radiotherapy Society (AIRO), a screening of the patients afferent to RT Departments is prescribed, consisting of temperature measurement and an anamnestic exam about respiratory symptoms and suspicious contacts (2). As per the Italian Health Ministry guidelines concerning staff protection, all HCWs – not specifically in radiation oncology, but generally in outpatient basis – are prescribed to uses PPE as mask FFP2, gloves, gowns and glasses only during the examination of patients with respiratory symptoms (3). These indications, both the scientific guidelines from AIRO and the legislative provisions, are probably grounded on a rather weak assumption: temperature and anamnestic collection are sufficient to avoid the entrance of COVID-19 positive patients in an RT Dept. Unfortunately, this is not the case.

In Brindisi RT department on 23rd March 2020, after her 5th daily RT session, a 30-year Hodgkin Lymphoma patient informed us she has been quarantined because her mother, a nurse, was found COVID-19 positive. The treatment was stopped according to national guidelines (2); subsequently, on March 31st, we were informed her test was positive. At the moment of writing (April 18), the patient is expected to resume, after two further tests resulted negative. It should be noted that before stopping the irradiation, she had already been treated to the mediastinum with a cumulative dose of 10 Gy: despite the patient was screened according to the abovementioned guidelines, these were insufficient to prevent the start of the treatment, exposing both the patient and the staff. Conversely, if she had been tested before the radiotherapy start, the treatment would have not been started and the risk of severe pneumonia lowered.

In Barletta RT department, on the 9th of April, a 66-year-old patient at her 28th out of 30 daily session of RT on the scalp for skin cancer informed her husband resulted COVID-19 positive after hospitalization for diarrhea. She was immediately quarantined and tested and the therapy interrupted. The first test was negative, but it should be repeated because the hypothesis of infection cannot be ruled out with just one

test (4). In this case, the RT treatment had almost been completed but we wonder how these cases should be managed, especially when patients are at the beginning of the treatment. Meanwhile, tests for all RT patients before treatment have been requested to the local management.

The large variability of the number of tests performed in Italy and the delay in the communication of the results (3-5 days on March 19th but our experience says of more days) (5) is not a good reason for not testing oncologic patients *before* antineoplastic treatment. The Health Ministry Recommendations state indeed that oncologic patients have higher risk (up to 4 times) of getting COVID-19 infection and more severe prognosis than normal population (6). We deem this should become integral part of the informed consent for RT therapy.

Moreover, it struck us with surprise that AIRO suggests nothing different than clinical screening for patients arriving to RT departments. The same applies to the first reports from Italian regions (Lombardy and Piedmont) with figures of incidence of SARS-COV-2 closest to those of China: one of them (7) considers the situation of treating patient suspected or COVID-19-positive and the other (8) states that in positive anamnestic case they provide surgical mask to the patient and do not stop the treatment. The treatment of suspected (not to mention positive) patients is highly risky, for both the staff personnel and the patient herself. RT treatments may have a negative impact on the patients' immune system, thus causing the potential mortality rate for such patients to skyrocket. It is indeed impossible, in the situations described in the mentioned papers, to determine whether the patient was positive during the RT treatment. It is moreover unclear whether such risks were mentioned within the informed consent form.

The experiences we read about from Chinese colleagues may provide some useful tips. In what is likely the first report on radiotherapy from Wuhan (China) (9), the screening procedure for HCW is described: "According to the COVID-19 diagnosis guidelines, the staff returning to work must be screened for the disease. Only those cleared the screening could return to posts". Furthermore "before returning to posts, the staff receives training to learn about COVID-19 prevention and protection. The staff learns the protection level of their corresponding role, the appropriate PPE for the role [...] as well as the dons and doffs". The radiotherapy center was zoned into different contamination levels and periodically disinfected following corresponding frequencies and protocols. Patients used surgical masks under the thermoplastic mask for cranial or head-and-neck cancer. Moreover, patients radiotherapy are screened for COVID-19 and "Only patients for whom COVID-19 has been ruled out can receive the treatment" (9). Before receiving radiotherapy, the patient is informed of the risk of cross-contamination during treatment and signs the informed consent.

Furthermore the evidence that «SARS-COV-2 has a high transmissibility rate in indoor environments and, therefore, asymptomatic patients admitted in the hospitals without respiratory symptoms have probably propagated the virus to unaware and unprotected health operators in departments other than infectious diseases.» (10) confirms our beliefs.

Based on the experience in the two Apulian departments and on the literature considered, we provide the following recommendation for admission and treatment of RT patients, in the current situation:

1. Every patient must undergo COVID-19 test before starting treatment (2 samples 24 hours apart) associated with serologic test;
2. If the treatment lasts more than one week, the test must be repeated weekly;
3. No patient must be admitted to the treatment with uncertain test;
4. The staff dedicated to clinical evaluation and treatment of patients have to wear PPE with all patients, as asymptomatic transmission cannot ruled out with the current information;
5. The staff must be tested at least monthly.

There are indeed evidences strongly suggesting that all patients must undergo COVID-19 test before starting RT and, likely, during the treatment. Moreover, staff should wear PPE presuming all patients may be COVID-19 positive. Finally, the patients must be informed, with a dedicated consent form, about the risk of infection attending a RT department and of the increased mortality risk in case of COVID-19 infection.

- (1) Portaluri M., Tramacere F. Portaluri T. Gianicolo EAL. Southern Italy: How the supply of radiation therapy, patient outcomes, and risk to health care providers have changed during the COVID-19 Pandemic. *Advances Radiat Oncol.* <https://doi.org/10.1016/j.adro.2020.03.016>
- (2) Associazione Italiana di Radioterapia Oncologica. Documento di indirizzo per la valutazione e la gestione del rischio dei pazienti e degli operatori nei reparti di radioterapia oncologica in corso di diffusione del COVID-19. 19 marzo 2020.
- (3) **Rapporto Istituto Superiore di Sanità COVID-19** Indicazioni ad interim per un utilizzo razionale delle protezioni per infezioni da SARS-COV-2 nelle attività sanitarie e socio-sanitarie nell'attuale scenario emergenziale ARS-COV-2. N. 2/2020 28 Marzo 2020.
- (4) **Consiglio Superiore di Sanità** Quesiti scientifici relativi all'infezione da Coronavirus SARS-CoV-2 Documento 28 febbraio 2020
<http://www.trovanorme.salute.gov.it/norme/renderNormsanPdf?anno=2020&codLeg=73458&parte=1%20&serie=null>
- (5) https://www.epicentro.iss.it/coronavirus/bollettino/Bollettino-sorveglianza-integrata-COVID-19_12-marzo-2020.pdf
- (6) Ministero della Salute Raccomandazioni per la gestione dei pazienti oncologici e onco-ematologici in corso di emergenza da COVID-19 March 1st, 2020
- (7) Filippi AR, Russi E., Magrini SM, Corvò R. Covid-19 outbreak in northern Italy; first practical indications for radiotherapy departments. *Int J Radiat Oncol Biol Phys* In press Available on line March 19th, 2020
- (8) Krengli, M, Ferrara E., Mastroleo F, Brambilla M, Ricardi U. Running a Radiation Oncology Department at the time of coronavirus: an Italian experience. *Advances in Radiation Oncology* In press.
[https://www.astro.org/ASTRO/media/ASTRO/Daily%20Practice/PDFs/COVID-Krengli-et-al-\(ADRO\).pdf](https://www.astro.org/ASTRO/media/ASTRO/Daily%20Practice/PDFs/COVID-Krengli-et-al-(ADRO).pdf)
- (9) Wu S. Zheng D., Yonsheng L. et al. Radiotherapy care during a major outbreak of COVID-19 in Wuhan. <https://doi.org/10.1016/j.adro.2020.03.004>
- (10) **Chririco F., Nucera G, Magnavita N.** COVID-19: Protecting Healthcare Workers is a priority *Infection Control & Hospital Epidemiology*
https://www.cambridge.org/core/services/aop-cambridge-core/content/view/A2DBF75B47E0D10CE676D0E14FB30034/S0899823X20001488a.pdf/covid19_protecting_healthcare_workers_is_a_priority.pdf

FIGURE 1: Technologists during the patient positioning with PPE (FFP2, visor, cap, gowns, gloves) The patient wears surgical mask under the immobilization device.

