



## RT Imaging as an Unintended COVID-19 Diagnostic Tool: Can be used for Screening before Thoracic RT?

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### Case Study

COVID-19 test is not routine for lung cancer patients' screening. But there is a need for screening in an apparently vulnerable oncologic patient population [1] especially in lung cancer patients who are described as most fragile cancer patient group by NHS [2].

There is an inevitable interval between the last date of radiologic evaluation and start of RT and therefore patients might be infected at any time during this period with COVID-19. Their identification is crucial because, in daily practice we might face a risk of scheduling Radiotherapy (RT) even radical radiochemotherapy to an asymptomatic infected patient. We do not know the risks of starting a RT program in an infected patient and the impact of thoracic RT on severity of COVID-19 induced lung damage. No scientific information is currently available. Especially, thoracic radiotherapy has major concern; in immunocompromised patients receiving radiochemotherapy for lung cancer the consequences of COVID infection are unknown, which might be linked to increased morbidity and mortality. Besides, there is a significant risk of infection for other patients and personnel.

We're luckier compared to medical oncologists that we have our CT-sim imagings just before the beginning of RT; which enables us for evaluating our patients in terms of radiological findings of COVID-19 in asymptomatic period. As far as we know, there has been two papers on the importance of daily RT imaging during RT and one paper on the importance of simulation CT and first day CBCT imaging findings in diagnosis of COVID-19 [1,2] (Figure 1).

Chest CT has been shown to be more sensitive than RT-PCR in some cases, especially in asymptomatic phase of disease [3]. Although CT-sim images have lower image resolution compared to diagnostic CTs, they may help to identify early signs of COVID-19 pneumonia in asymptomatic phase.

Here, we report a case of 61 years old, male patient who had diagnosis of adenocarcinoma of lung, stage T4N2M1b ever [4] with multiple brain and bone metastases and referred to our department for palliative RT. He had past history of 45 pack-years of smoking. He had no co-morbidity. He

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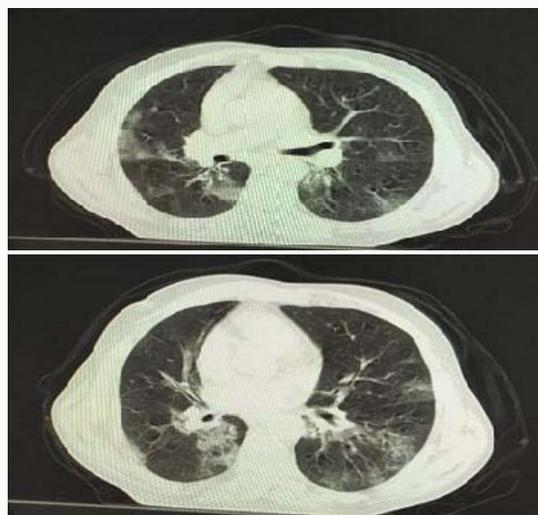


Figure 1: Simulation CT findings with bilateral ground glass opacities.

had whole brain radiotherapy (5x400cGy) and steroid treatment for brain metastases. The day after the completion of WBRT schedule, CT-simulation for thoracic bone metastases RT was carried out. During review process of CT-sim images multiple bilateral GGO were recognized, then he was consulted with chest and infectious diseases. COVID-19 test result was (+). He was in asymptomatic period. RT was postponed and steroid tapering was fastened. He was hospitalized and had COVID-19 treatment according to local policy. He developed symptoms 48 h after our CT-sim findings. After 20<sup>th</sup> day of hospitalization his test became negative and he was discharged from the hospital. (18.3.2020 there is no infiltration in PET.CT-sim 6<sup>th</sup> April-admission 9<sup>th</sup> April).

We might have 2 advantages by early recognizing the COVID-19 infiltrates in CT-sim in an asymptomatic patient; first of all, we contributed in early diagnosis of COVID-19 and might had an positive influence on patient's prognosis. Secondly, we might had prevented potential silent contamination of other patients or our staff during RT schedules since he is in asymptomatic phase. Besides this patient has proved us that our protection measures is working well; since he had WBRT schedule for 5 days just before the CT-sim with COVID-19 infiltrates and there was no cross infection in our department. This method might give us the opportunity of earlier detection of COVID-19 infection and outcome of the patients might improve [5]. Besides, this might prevent contagion of RTT, other patients and patient's family or caregivers.

## Conclusion

Therefore, we advise vigorous evaluation of planning CT-sim images in parenchymal window in terms of unexpected COVID-19 infiltrates routinely just before starting treatment planning procedures and training simulation technicians accordingly. We think that, imaging techniques for simulation can be used as a screening tool for COVID-19 in patients undergoing thoracic RT with their potential role in early detection. Clinical utility of this method should be tested.

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