

## Clinical Case of Severe Bilateral Associated Pneumonia with Sars-Cov-2 Viral Infection

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### Abstract

Coronavirus infection spreads rapidly and is transmitted from person to person by airborne and contact-household means. A positive PCR test for Sars-Cov-2 is required for a definitive diagnosis. However, MSCT is a sensitive and specific method of diagnosing coronavirus lung disease as the most common manifestation of infection. In addition, in patients at high risk for Covid-19, signs of viral pneumonia in pulmonary MSCT may precede negative PCR results. On their own experience and observations in the diagnosis of severe respiratory syndrome Sars-Cov-2 draw attention to the need to perform MSCT of the chest in patients at high risk and clinical manifestations of Covid-19 associated pneumonia, despite the initial negative results of PCR tests.

**Keywords:** Coronavirus Infection; Lung Lesions; PCR Testing; MSCT of Chest Organs

### Introduction and Case Study

Covid-19 (coronavirus disease 2019) is a fairly new pulmonary viral infection caused by the coronavirus of severe respiratory syndrome Sars-Cov-2.

Coronavirus infection spreads rapidly and is transmitted from person to person by airborne and contact-household route; leads to severe complications such as pneumonia and fibrosis, acute respiratory and heart failure, blood coagulation dysfunction, as well as severe myocarditis and hemorrhagic necrotic encephalopathies with predominant lesions of the thalamic areas [1].

A positive PCR test for Sars-Cov-2 is required for a definitive diagnosis.

However, MSCT is a sensitive and specific method of diagnosing coronavirus lung disease as the most common manifestation of

infection. The method is suitable both for primary diagnosis and for monitoring patients in the dynamics of treatment and early detection of complications (accession of bacterial pneumonia, pulmonary embolism, etc.), monitoring the evolution of the latter.

In addition, in patients at high risk for Covid-19, signs of viral pneumonia in MSCT of the lungs may precede negative PCR test results and thus be a strong argument for re-laboratory testing for Sars-Cov-2 [2].

Here is a clinical observation performed on the basis of our clinic.

Z.'s husband, 64 years old, complained of a rise in body temperature to 38.5 degrees. During the last 5 days, the presence of unproductive cough, general weakness, shortness of breath. History of contact with patients infected with Sars-Cov-2. Oxygenation

of blood on the day of treatment 94 - 95%. The initial PCR test is negative. The patient's condition was assessed by the family doctor as satisfactory, the previous diagnosis was SARS.

On examination at the clinic - sweating, constant coughing, lethargy.

At physical examination - hard breathing on both sides throughout, more on the right, tachypnea, tachycardia (110 beats/min.).

During the laboratory examination - a decrease in the number of lymphocytes and platelets, an increased number of monocytes and ESR, minor anemia, increased levels of D-dimers.

On MSCT of the chest (Figure 1): bilateral, asymmetric, draining areas of pathological lesions of frosted glass with a layer of thickened intra-lobular and interlobular membranes (paving stone) (Figure 2) [3].

**Figure 1:** MSCT OGK of patient Z. in the axial plane. The arrows indicate the areas of pathological lesions of the pulmonary parenchyma of the frosted glass.

**Figure 2:** MSCT OGK patient 3. in the coronary plane. The arrow indicates the areas of lesion of the lung parenchyma paving stone.

Based on imaging, laboratory, physical, and anamnestic data, an diagnosis of acute bilateral viral pneumonia, more likely to be associated with Sars-Cov-2, was made.

The next day, a repeat PCR test was performed with a positive result.

The patient was referred to the specialized department of the district hospital for inpatient treatment. Unfortunately, the patient's condition deteriorated sharply due to the increase in the phenomena of respiratory distress syndrome, which led to fatal consequences.

Our report emphasizes the need for a multidisciplinary (clinical, laboratory, radiological) approach in the examination of patients with probable moderate and severe viral pneumonia. This is necessary for timely verification of the diagnosis and effective pathognomonic treatment in order to reduce mortality, prevent complications, reduce the time of inpatient treatment and, if necessary, the rehabilitation period.

Thanks to our proposed survey technique, which is to optimize the scan protocol for high-resolution computed tomography (HRCT) on the device Siemens Somatom GoUp (Germany) in 2019, performed according to the following scan protocol:

- Frontal scan of the topogram [Tr20] with a length of 512 mm, with individual selection and correction of Kv parameters; Effective mAs using CARE Dose4D technology with calculation of optimal QualityReferencemAs (QRM) for each angular projection of the patient's anatomical area.
- Native (non-contrast) chest scan, respiratory arrest using the protocol: low Dose and fast Scanina Patient with Dyspnea (Collimation: 32 x 0.7 mm, Rotationtime: 0.8s, Pitchfactor: 1.5, Scanparameters: Sn110 (with Tin Filter) ) kV/60mAs, Scan time: 9s). SAFIRE reconstruction algorithm [1.5 mm filtration stiffness - br40 (Soft); Br - 60 (lung)]. Postprocessing image processing MPR-, MIP, MinIP, Aug [3].

This scanning protocol in MSCT studies provides increased accuracy of diagnosis of characteristic of Covid-19 early radiological signs, as well as reduce radiation exposure to the patient.

## Conclusion

Thus, in our own experience and observations in the diagnosis of severe respiratory syndrome Sars-Cov-2 we draw attention to the need to perform MSCT of chest organs in patients at high risk and clinical manifestations of Covid-19 associated pneumonia, despite the initial negative results of PCR tests [4].

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### Authors Contribution

The contribution of the authors Boryshevska-Lohin Olena A, Ahii Vladyslava I, Peresta Yurii Yu, Akar Stanislav Y, Lohoida Olha L and Hanbarov Nikita P is the same.

### Conflict of Interest

The authors state that they have no conflict of interest.

### Consent to Publication

The authors read and approved the final version of the manuscript and agreed to publish this manuscript.

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