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CLINICAL VIGNETTE

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SARS-CoV-2 recurrent infections in a patient with metastatic colon cancer during chemotherapy

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A 72-year-old man with a metastatic *KRAS* gene mutated colon adenocarcinoma was admitted to the hospital for effort dyspnea and subfebrile body temperature. He was after transversostomy in 2019 and in the course of a palliative chemotherapy FOLFIRI regimen (irinotecan, calcium folinate, 5-fluorouracil) with secondary prophylaxis with filgrastim. On admission (August 2020), his general condition was quite good — Eastern Cooperative Oncology Group Performance Scale 1 (ECOG PS 1). He reported fatigue, dyspnea, partial loss of taste, and cold sweat. A polymerase chain reaction test (RT-PCR; KIT LabSystem) was positive for SARS-CoV-2 (RdRP, E, and N gene positive). In this period, the variant of the concern (VC) was primarily Wuhan SARS-CoV-2. Non-contrast computed tomography (NCCT) of the chest showed ground glass opacifications in the subpleural region, focal consolidations, and moderate pleural effusion, mostly in the lower field of the right lung (Fig. 1A, B). The patient was admitted to a single-ward hospital for the treatment of pneumonia. He received oxygen therapy, a prophylactic dose of low molecular weight heparin, ceftriaxone, and 1 unit of convalescent plasma. He finished the treatment after 13 days, obtaining the elimination of the virus confirmed by the RT-PCR test and resolution of inflammatory changes in the control NCCT (Fig. 2A, B). Due to treatment with convalescent plasma, he was not qualified for direct vaccination against SARS-CoV-2. Then, from 09/2020, due to colon cancer progression, he received the second-line palliative chemotherapy FOLFOX4 (oxaliplatin, calcium folinate, 5-fluorouracil). In April 2021, he was hospitalized in the Surgery Department to restore the continuity of the digestive tract. After the operation, the SARS-CoV-2 RT-PCR test was positive again. In this period, the British variant (Alpha) was dominant

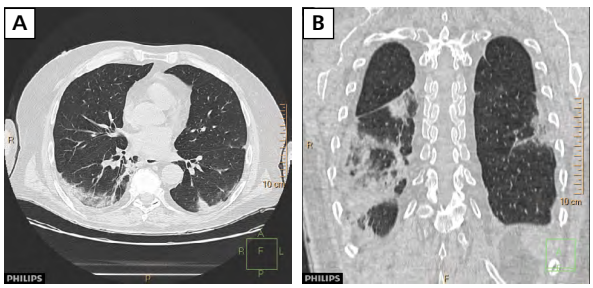

Figure 1. Non-contrast computed tomography of the chest lung window was performed on the day of admission. The pulmonary changes in keeping with SARS-CoV-2 infection are visible — ground glass opacifications in the subpleural region, focal consolidations, and moderate pleural effusion; **A.** Axial scan; **B.** Coronal scan

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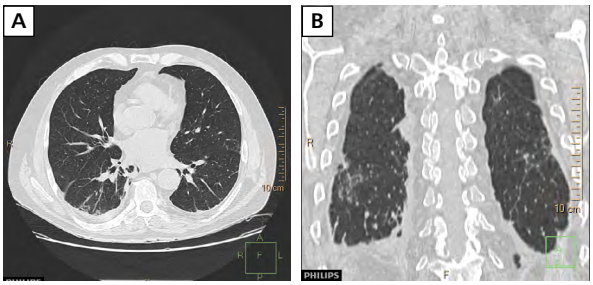

Figure 2. Non-contrast computed tomography of the chest lung window was performed on the 9th day of treatment. The partial regression of pulmonary changes in keeping with COVID-19 infection are visible — subpleural fibrotic changes and moderate pleural effusion; **A.** Axial scan; **B.** Coronal scan

(who.int/activities). Chest NCCT showed patchy interstitial densities in the lower and middle fields of both lungs. He was in good general condition (ECOG 1), without symptoms of respiratory failure or fever, but he had a purulent discharge from the postoperative wound. He was admitted to the isolation ward and initially treated with cefuroxime and metronidazole, and then according to the antibiogram for *Morganella morgani* with piperacillin-tazobactam, and ciprofloxacin. During hospitalization, he developed shortness of breath and severe respiratory symptoms (saturation when breathing room air < 90%) with increasing inflammatory parameters. We administered oxygen therapy, steroid therapy, transfusion of 1 unit of convalescent plasma, and remdesivir in a loading dose of 200 mg intravenously followed by 100 mg daily for 5 days in total. Respiratory efficiency improved and saturation normalized (≥ 95%). One month later, he was admitted in emergency mode and operated on due to an entero-cutaneous fistula and wound infection. He died in June 2021 due to postoperative complications.

Patients with colorectal cancer are in the group with increased risk of severe complications during SARS-CoV-2 infection [1]. This group includes all immunocompromised patients, regardless of their vaccination status, as well as people aged > 70 years who have received the last dose of the primary series of vaccination > 6 months and have an additional risk factor, e.g. active cancer [2]. The several key complications of SARS-CoV-2 infection in this group is COVID-19-disease pneumonia that can lead to acute respiratory distress syndrome. The course of SARS-CoV-2 infection and COVID-19 disease in immunocompromised patients depends on the immune system efficiency and probably on the virus variant. SARS-CoV-2 vaccines reduce the risk of developing a severe infection and improve the prognosis of patients with COVID-19 disease. According to recent studies, patients with gastrointestinal cancer undergoing systemic therapy have a good immune response to vaccination [3]. Lau et al. showed that the anti-spike antibody level significantly increased after the first dose of the vaccine, and one month after the second dose, 90% of patients have seropositivity [3]. However, the pseudoviral neutralization (pVNT80) decreased after 20–39 days after the second dose [3]. According to the recommendations, the SARS-CoV-2 vaccine should be given before the start of the chemotherapy or before the next cycle to avoid the nadir phase [4]. Due to the waning of vaccine immunity booster doses are now widely recommended [2].

Article Information and Declarations

Author contributions

F.Z., R.D.: conception and design.
All authors: provision of study materials or patients, collection and assembly of data, data analysis and interpretation, manuscript writing, final approval of manuscript.

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None.

Conflict of interest

The authors declare no conflict of interest.

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