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Continued Immunotherapy of Patient with Lung Cancer with COVID-19 Infection

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May 29, 2023

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Financial/nonfinancial disclosures: None declared.

FUNDING/SUPPORT: This work was supported by the Clinical Research Incubation Project of West China Hospital of Sichuan University (2018HXFH012), the National Natural Science Foundation of China (82200078)

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To the Editor :

The COVID-19 pandemic has infected over 763.7 million people globally, causing over 6.9 million deaths (https://covid19.who.int/; accessed 15 April 2023). Omicron has received much attention for just 2 weeks after its appearance on November 11^{th}, 2021 for its rapidly spreaded variants infectivity. The emerging of new variants of SARS-CoV-2 become the predominant strains during the pandemic. Similar with comorbidities such as diabetes and cardiovascular disease[1], patients with cancer seems to be highly risk of acute respiratory syndrome coronavirus 2 (SARS-CoV-2)[2].

A major consideration in the delivery of cancer care is to balance the duration of delaying the cancer-directed therapy. SARS-CoV-2 can mediated immune system activation by triggerring cytokine release[3], which may lead to a great potential for treating SARS-CoV-2 infections by targeting immune related receptors. To mild to moderate COVID-19 or asymptomatic positive SARS-CoV-2 patients, the NCCN Guidelines recommend considerring holding immune checkpoint inhibitors therapy for at least 10 days and until improvement of symptoms (https://www.nccn.org). Whether checkpoint inhibitor treatment lead to a better or worse outcome maintain controversial. Here, we report the management of three lung cancer patients during Omicron period through a multidisciplinary perspective on the basis of clinical experience and the available data in the literature, the general characteristic of patients were showed in **Table 1** .

The first case is a 65-year-old male, 30 years of smoking history, with a 1.8cm*1.3cm right lower lobe node,

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with liver and multiple bone metastases. Liver lesion puncture biopsy prompt neuroendocrine tumor. Next generation sequencing (NGS) detection indicated no oncogenic mutations. The patient had symptoms of fatigue and fever and performed rapid test of nasopharyngeal swab for respiratory SARS-CoV-2 viruse, which prompt strongly positive. He commenced with slurryMab combined with etoposide and carboplatin as first-line therapy. A computed tomography (CT) scan of the chest revealed lesion reduction after 3 months, with disease assessment of partial response (PR) (**Figure 1B**). The second case was a 63-year-old Chinese male ex-smoker presented with a pulmonary mass in the right lobe lung apex mass discovered on chest enhanced-CT scan, with bilateral lung and bone metastasis. Histologic examination of the biopsy samples at lung mass led to the diagnosis of advanced lung squamous carcinoma. COVID-19 nucleic acid test prompt positive. He signed informed consent and was treated with was treated with Pembrolizumab+Vibostolimab. CT scan after 2 month showed obvious shrinkage in lung mass, contributing to PR (**Figure 1B**). The patient reported feeling better after and no side effects occurred. The third was a 70-year-old male never-smoker referred to a local hospital for repetitive cough in June 2022. Chest-CT scan revealed a pulmonary mass in the left upper lobe and left pleural thickening. Cerebral magnetic resonance image demonstrated no brain metastasis and bone imag revealed multiple bone metastases. Biopsy on lung tissue demonstrated squamous carcinoma and subsequent targeted NGS detected no oncogenic mutations. Then the patient started duvalizumab combined with albumin paclitaxel and carboplatin as first-line therapy for four circles and single-agent duvalizumab maintenance for two cycles. Nasal swab was positive for COVID-19 in January 12^{th}, 2023. He received nirmatrelvir plus ritonavirand for strongly positive of COVID-19 nucleic acid test with low Ct value. The clinical cough symptom of patients improved two days later and he continued receiving duvalizumab maintenance treatment. Stable lung lesions were shown through CT scan after 1 months and no novel added COVID-19 symptoms presented (**Figure 1B**). Above patients manifest no viral symptom after active treatment with checkpoint inhibitor and continue to receive anti-tumor treatment (**Figure 1A**).

The cancer patients receiving antitumour treatments should be strictly screened for COVID-19 infection during epidemic period and avoid treatments causing immunosuppression or decrease the dosages of medication. These cases emphasized immunotherapy has no detrimental effect on the outcome of mild to moderate patients with COVID-19.

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Figure Legend

Figure 1. Immunotherapy therapy duration. A. A swimmer's plot revealing of disease course and therapeutic efficacy of immunotherapy after COVID-19 infection. Chest computed tomography scans during the patient's clinical course. Brown arrows indicate tumors.

Abbreviation: P patient.

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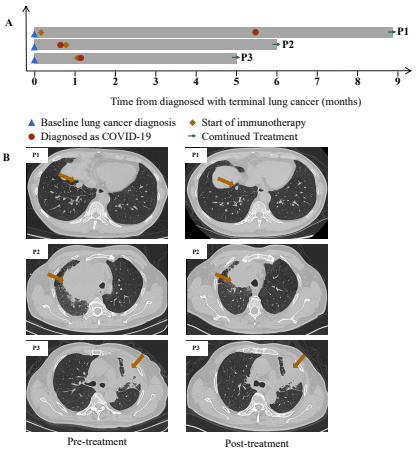

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Table 1.docx available at https://authorea.com/users/623199/articles/646045-continued-immunotherapy-of-patient-with-lung-cancer-with-covid-19-infection