# A case of coronavirus disease 2019 with twice negative nucleic acid testing within 8 days

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*To the Editor*: To date, coronavirus disease 2019 (COVID-19) has spread all over the world. As the exact sources of the virus, the time of virus shedding after infection and viral propagation are still undefined, there are still great challenges in controlling the virus spreading and the treatment of infection. Rapid diagnosis of infection cases and early isolation are extremely important for the overall prevention and control work.[1] Therefore, rapid diagnosis of infection cases and early isolation are extremely important for overall disease prevention and control.[2]

In recent days, network media reported confirmed COVID-19 cases with more than two negative nucleic acid testing results at an early stage. However, detailed reports are still lacking. Therefore, we report here the history and clinical data of a confirmed case with negative 2019 novel coronavirus (2019-nCoV) nucleic acid test results within 8 days of onset and the final positive test result confirmed on the 11th day of onset in the Shenzhen University General Hospital.

A 47-year-old woman who traveled to Wuhan on January 13, 2020 with her mother (who was later confirmed to be infected with the COVID-19) had an intermittent fever (highest body temperature: 37.9°C) on January 20, 2020 accompanied by coughing. Two days later, she was admitted to the Third People's Hospital of Shenzhen. Initially, her blood test revealed a normal white blood cell count ($4.94 \times 10^9$/L) and decreased lymphocyte count ($1.06 \times 10^9$/L), with an oxygen saturation level of 99%. After admission, the patient received atomized inhalation of interferon twice daily. 2019-nCoV nucleic acid testing by sampling from a throat swab on January 22 and 28 failed to show positive results.

On June 29, 2020, the patient was transferred to the Shenzhen University General Hospital for further isolation and clinical observation. At admission (day 9 of onset), the patient had worsened headache and cough, but her body temperature (36.0–37.2°C) and oxygen saturation level (99%) remained relatively normal. Her blood test result showed a normal white blood cell count ($5.81 \times 10^9$/L) and decreased lymphocyte count ($0.91 \times 10^9$/L). Chest computed tomography revealed bilateral ground-glass opacity [Figure 1]. Besides atomized inhalation of interferon, oseltamivir (75 mg) was orally administered twice daily.

On January 31 (day 11 of onset), the blood gas analysis of the patient revealed dramatic deterioration (partial pressure of oxygen, 65.5 mmHg; partial pressure of carbon dioxide, 39.2 mmHg; and sulfur dioxide, 93.6%). 2019-nCOV nucleic acid testing was performed again by sampling from nasal swabs. The result showed positivity for COVID-19 infection, which was also verified by the Centers for Disease Control.

According to the New Coronavirus Infection Pneumonia Protocol (version 6) published by the National Health Commission of the People's Republic of China, two consecutive negative respiratory 2019-nCoV nucleic acid test results (at least 1 day apart) are required for exclusion of COVID-19.[3] However, cases with highly suspected epidemiological history, typical clinical, laboratory, and radiological characteristics cannot be excluded. In the present case, the patient had a definite epidemiological history, characteristic pulmonary imaging findings, and typical clinical symptoms. However, no virus nucleic acid sequence was detected for 8 days and until the 11th day of onset, indicating the presence of a non-parallel relationship between 2019-nCoV nucleic acid testing and clinical symptoms.

At present, nasal and throat swabs are often used for sampling of specimens for 2019-nCoV nucleic acid testing. The previous research conducted on influenza virus diagnostic tests showed that influenza viruses of different sub-types preferentially localized at different sites, resulting in

Access this article online

Quick Response Code:

Website: www.cmj.org

DOI: 10.1097/CM9.0000000000000788

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Chinese Medical Journal 2020;133(12)

**Received:** 03-02-2020 **Edited by:** Peng Lyu

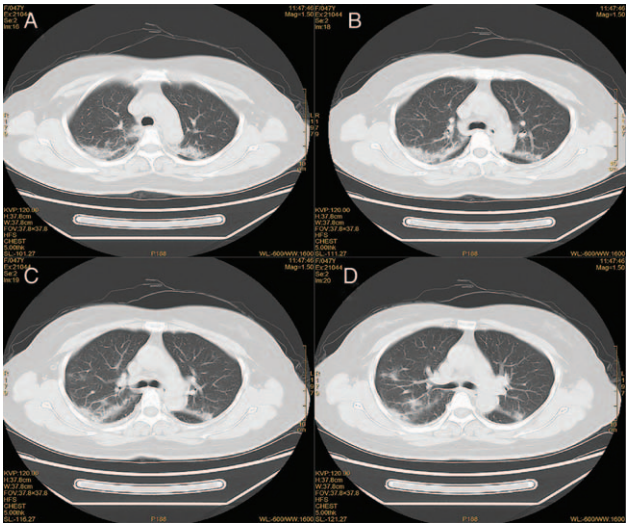


**Figure 1:** Continuous chest computed tomography scans of the patient. (A) shows multiple ground-glass density shadows in the lower lobe of both lungs at the level of the aortic arch (B–D) are continuous faults extending downward.

a variation in the positive detection rates from different sampling sites.[3] To date, the exact biological characteristics of COVID-19 are still undefined, including its variant subtypes or preferred localizing sites.[4] Therefore, for this case, we suspect that changing the sampling site from the throat to the nasal region might have contributed to the positive result. At the time of write this case report, we had four patients with negative throat swabs who later tested positive using nasal swabs. The digestive system is another route for 2019-nCoV infection,[5] also suggesting that the localizing sites of the 2019-nCoV may differ based on route of infection.

Accordingly, for patients with suspicion of COVID-19, multiple site sampling is conducive to earlier detection of 2019-nCoV. In addition, the status of the patients shortly before sampling should also be taken into consideration, as anti-viral nebulization treatment might influence the positive detection rate. Efforts need to be made to improve the efficiency of virus detection at an early stage for better prevention and control of the spread of the COVID-19.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. The patient has given her consent for the publication of her images and other clinical information in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

## Funding

This study was supported by a grant from the Sanming Project of Medicine in Shenzhen (No. SZSM201911007).

## Conflicts of interest

None.

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**How to cite this article:** Ruan ZR, Gong P, Han W, Huang MQ, Han M. A case of coronavirus disease 2019 with twice negative nucleic acid testing within 8 days. Chin Med J 2020;133:1487–1488. doi: 10.1097/CM9.0000000000000788