Radiology

Use of Chest CT in Combination with Negative RT-PCR Assay for the 2019 Novel Coronavirus but High Clinical Suspicion

*Peikai Huang, MD** • *Tianzhu Liu, MD** • *Lesheng Huang, MD* • *Hailong Liu, MD* • *Ming Lei, BD* • *Wangdong Xu, BD* • *Xiaolu Hu, BD* • *Jun Chen, MD* • *Bo Liu, MD*

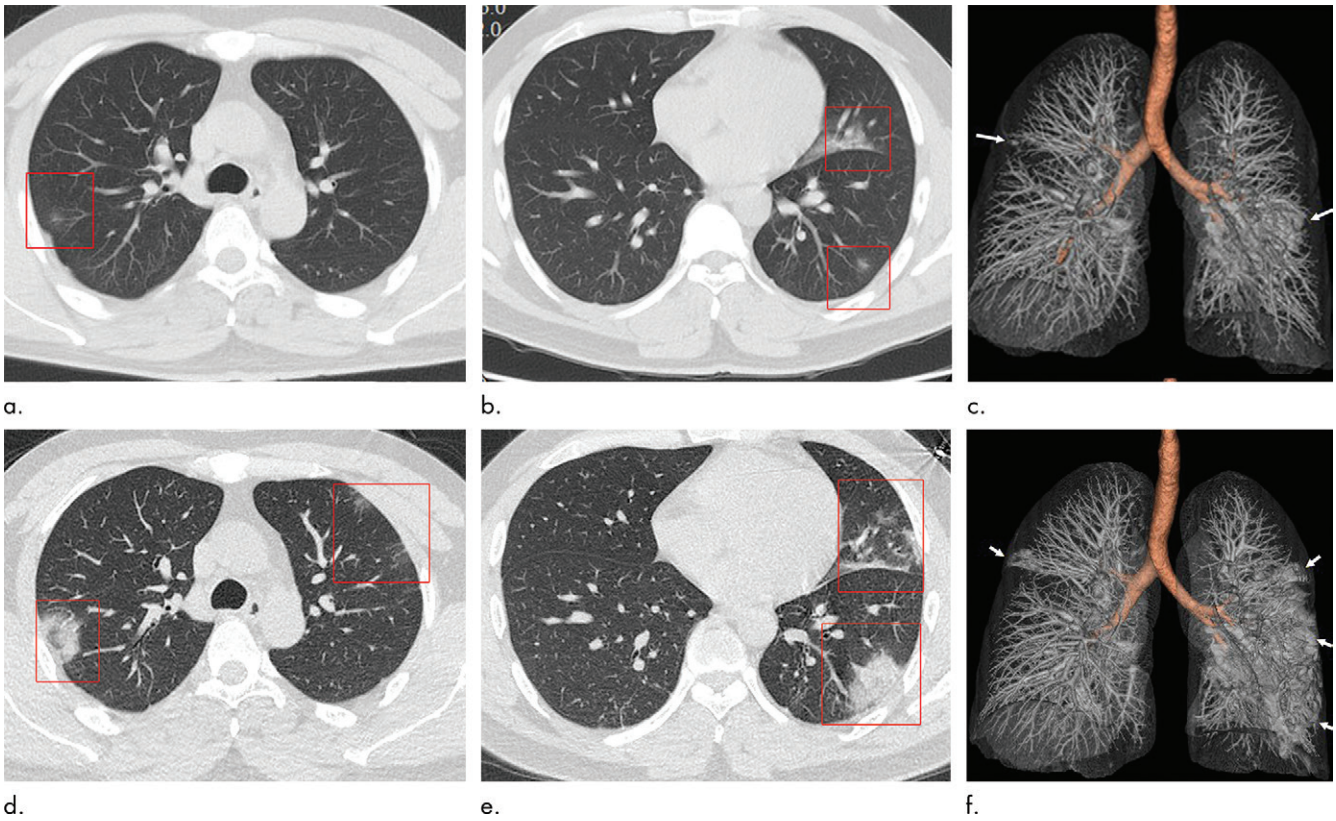
From the Department of Radiology, Guangdong Hospital of Traditional Chinese Medicine, Zhuhai 519000, China (P.H., T.L., L.H., H.L., M.L., W.X., X.H., J.C.); and Department of Radiology, Guangdong Hospital of Traditional Chinese Medicine, No. 111 Dade Rd, Guangzhou 510000, China (B.L.). Received February 6, 2020; revision requested and received February 7; accepted February 9. **Address correspondence to** B.L. (e-mail: *liubogzcm@163.com*).

*P.H. and T.L. contributed equally to this work.

Conficts of interest are listed at the end of this article.

Online supplemental material is available for this article.

Radiology 2020; 295:22–23 • https://doi.org/10.1148/radiol.2020200330 •



Images in a 36-year-old man with a 2-day history of fever, sore throat, and fatigue 5 days after visiting Wuhan, China, and a negative sputum real-time fluorescence polymerase chain reaction assay for the 2019 novel coronavirus. **(a, b)** Chest CT scans obtained at presentation show ground-glass opacities (red box) in the right upper lobe and the lingular segment and left lower lobe (**b**). **(c)** Volume rendering of chest CT scan obtained at admission. **(d, e)** CT scans obtained 3 days after admission show progression of ground-glass opacities to an atoll sign in the right upper lobe (red boxes in **d**) and left lower lobe consolidation (red boxes in **e**). **(f)** Volume rendering of chest CT scan obtained 3 days after admission shows the new areas of consolidation. See also Movies 1 and 2 (online)

A 36-year-old man presented to the hospital with a 2-day history of fever, sore throat, and fatigue 5 days after visiting Wuhan, China. His temperature on admission was 37.8°C (100.04°F). Pulmonary auscultation was normal. Laboratory studies showed a normal white blood cell count (4.6×10^9/L) with a differential count of 53.1% neutrophils. The blood procalcitonin level was normal. Chest CT showed multiple peripheral ground-glass opacities in both lungs with more involvement of the left upper lobe, lingular segment (Figure a–c). At admission, the real-time fluorescence polymerase chain reaction (RT-PCR) assay of the sputum was negative for the 2019 novel coronavirus (2019-nCoV) nucleic acid.

Repeat CT chest performed 3 days after admission showed transformation of ground-glass opacities to more consolidation (Figure d–f). A repeat RT-PCR 2019-nCoV nucleic acid assay was also negative at this time. Six days after admission, the third RT-PCR 2019-nCoV nucleic acid assay was finally found to be positive.

When specimen tests are negative, the possibility of a false-negative result should be considered in the context of a patient's recent exposures and the presence of clinical signs and symptoms consistent with 2019-nCoV infection (1,2). In this case, chest CT findings were typical of findings for 2019-nCoV pneumonia (3) coupled with recent exposure suggesting that 2019-nCoV infection was likely.

Disclosures of Conflicts of Interest: P.H. disclosed no relevant relationships. **T.L.** disclosed no relevant relationships. **L.H.** disclosed no relevant relationships. **H.L.** disclosed no relevant relationships. **M.L.** disclosed no relevant relationships. **W.X.** disclosed no relevant relationships. **X.H.** disclosed no relevant relationships. **J.C.** disclosed no relevant relationships. **B.L.** disclosed no relevant relationships.

References

1. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, Zhao X, Huang B, Shi W, Lu R, Niu P, Zhan F, Ma X, Wang D, Xu W, Wu G, Gao GF, Tan W; China Novel Coronavirus Investigating and Research Team.. A Novel Coronavirus from Patients with Pneumonia in China, 2019. N Engl J Med doi: 10.1056/NEJMoa2001017. Published online January 24, 2020.
2. FDA. Fact sheet for healthcare providers: CDC - 2019-nCoV Real-Time RT-PCR Diagnostic Panel. https://www.fda.gov/media/134920/download. Published February 4, 2020. Accessed February 6, 2020.
3. Song F, Shi N, Shan F, et al. Emerging Coronavirus 2019-nCoV Pneumonia. Radiology 2020. https://doi.org/10.1148/radiol.2020200274. Published online February 6, 2020.