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Letter to the Editor

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The Role of Bronchoscopy in COVID-19

Zhu-Quan Su[a] Tao-Sheng Ye[b] Di-Fei Chen[a] Xi-Long Deng[c] Huan-Jie Chen[a] Shi-Yue Li[a]

[a]State Key Laboratory of Respiratory Disease, National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Health, The First Affiliated Hospital of Guangzhou Medical University, Guangzhou, China; [b]Shenzhen Third People's Hospital, Shenzhen, China; [c]Guangzhou Eighth People's Hospital, Guangzhou, China

Dear Editor,

The novel coronavirus disease 2019 (COVID-19) outbreak from Wuhan, China, in January 2020 has now involved 132 countries and regions. So far (March 13, 2020), an estimated 80,911 infected cases have been registered in China, and dramatically, more than 1,700 clinicians have been infected. The rapid identification of COVID-19, isolating the suspected cases, and limiting human-to-human transmission have contributed to the great importance of preventing and controlling the epidemic.

Due to the high risk of exposure to the virus and interperson transmission, the Chinese expert consensus [1] explicitly stated that bronchoscopy should not be used as a routine means for the diagnosis of COVID-19 but only be performed if urgently needed, particularly in critical cases.

The precaution for conducting bronchoscopy needs to be strictly implemented. In light of the guideline for isolation precautions from the U.S. Centers for Disease Control and Prevention [2], the aggressive measures such as N95 mask, goggle, and protective gown play a crucial role on the protection for the bronchoscopic procedure. In the current case of COVID-19, if appropriate, the positive-pressure respiratory protective hood confers to strengthen the protection from occupational exposure. We have performed bronchoscopy in 27 cases with COVID-19 with the appropriate personal protective equipment, and no clinicians were infected in our units.

All 27 cases with critical severe COVID-19 who received bronchoscopy were in the intensive care unit. The procedures consisted of nasal endotracheal intubation under the guidance of bronchoscope (12/27), sputum aspiration (27/27), and bronchoalveolar lavage (BAL) (15/27). The bronchoscopic examination in 27 cases with COVID-19 showed mucosal hyperemia and edema, and intraluminal secretion in the segmental bronchus, but not in the central airways.

Endotracheal intubation is an aerosol-generating procedure, which is considered an independent risk factor of airborne transmission such as severe acute respiratory syndrome (SARS) [3]. The 2019-nCoV could spread via cough or respiratory droplets, and bodily fluids. Compared to laryngoscopy-guided intubation, which might cause cough and vomit, nasal endotracheal intubation under the guidance of bronchoscope should be considered as a safer and more rapid procedure: (1) there is a greater distance between operator and patient; (2) the bronchoscope connects with the sputum aspirator, which ensures the drainage of secretion during the procedure; and (3) the adequate exposure of the glottis and the guidance of bronchoscope increase the one-time successful rate of intubation.

Zhu-Quan Su, Tao-Sheng Ye, Di-Fei Chen, Xi-Long Deng and Huan-Jie Chen contributed equally to this work.

karger@karger.com
www.karger.com/res

Shi-Yue Li, State Key Laboratory of Respiratory Disease
National Clinical Research Center for Respiratory Disease
The First Affiliated Hospital of Guangzhou Medical University
151 Yanjiang Road, Guangzhou 510120 (China)
lishiyue@188.com

It was recently reported that some atypical cases with positive chest computed tomography findings present with negative results of reverse transcription-polymerase chain reaction (RT-PCR) for 2019-nCoV [4]. At the time of writing, we found 3 cases (3/27) exhibited coughing, shortness of breath, and cloud-like high-density shadows of CT findings, but had negative oropharyngeal swab nucleic acid test. The timely diagnosis and treatment might help control the further spread of COVID-19, particularly in rapidly progressing cases. These three suspected patients received bronchoscopy and BAL, showing viscous secretion in BAL fluid and positive results of RT-PCR for 2019-nCoV. The 2019-nCoV viral load varies in nasal and throat cells as the disease progresses, and the recent clinical pathology report showed that 2019-nCoV mainly lead to inflammatory injury involving lower airways and alveoli [5]. Hence, samples obtained from the lower airways (e.g., endotracheal aspirate, BAL fluid) for nucleic acid test might increase the diagnostic yield of COVID-19. The clinical pathology report further revealed congestive alveolar cavity, which contained viscous mucus, edema fluid, and desquamated epithelial cells. It might shed light on the role of bronchoscopy and BAL in COVID-19, which could help remove the viscous mucus in the distal airways and improve ventilation in critical severe cases.

In summary, conducting bronchoscopy in COVID-19 is suggested to be carefully deliberated and strictly mastered, and it should only be performed in urgent situations under the protection of personal protective equipment. Bronchoscopy could be performed for the guidance of endotracheal intubation, sputum aspiration, and BAL, all of which might help enhance the safety of intubation, increase the diagnostic yield of RT-PCR for 2019-nCoV, and improve ventilation in critical cases.

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The authors have no conflicts of interest to declare.

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Author Contributions

Z.-Q.S., T.-S.Y., D.-F.C., X.-L.D and H.-J.C. performed the literature search and drafted the manuscript; Z.-Q.S., T.-S.Y., D.-F.C., X.-L.D, H.-J.C. and S.-Y.L. contributed to the study conception, data collection, and data interpretation; S.-Y.L. provided a critical review of the manuscript and approved the final submission.

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