


Negative pressure pulmonary edema in a patient with COVID-19

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Abstract

Negative pressure pulmonary edema (NPPE) should be considered in the differential diagnosis from an episode of asphyxia, and even if NPPE is diagnosed, the possibility of COVID-19 should be kept in mind under coronavirus pandemic conditions.

KEYWORDS

bloody sputum, COVID-19, negative pressure pulmonary edema

CLINICAL IMAGE

A healthy 60-year-old woman had bloody sputum, felt like choking and experienced dyspnea. She was hypoxemic (SpO₂, 92% receiving oxygen at a rate of 10 L/min). The blood tests revealed: a white blood cell count (6770/ μ l) and C-reactive protein (0.77 mg/dL). Chest radiograph showed an infiltrative shadow in both upper lungs and chest computed tomography findings showed ground-glass opacity predominant with bilateral upper lobes (Figures 1 and

2A). The polymerase chain reaction test confirmed coronavirus disease 2019 (COVID-19); however, the patient's respiratory status improved rapidly (SpO₂, 95% receiving oxygen at a rate of 1 L/min) before the initiation of COVID-19 treatment (Figure 2B). We strongly suspected negative pressure pulmonary edema (NPPE) based on the episode of asphyxia, the characteristic CT images, and the rapid improvement without treatment. NPPE is a type of noncardiogenic pulmonary edema. It was first reported in adult patients in 1977 and is a life-threatening condition

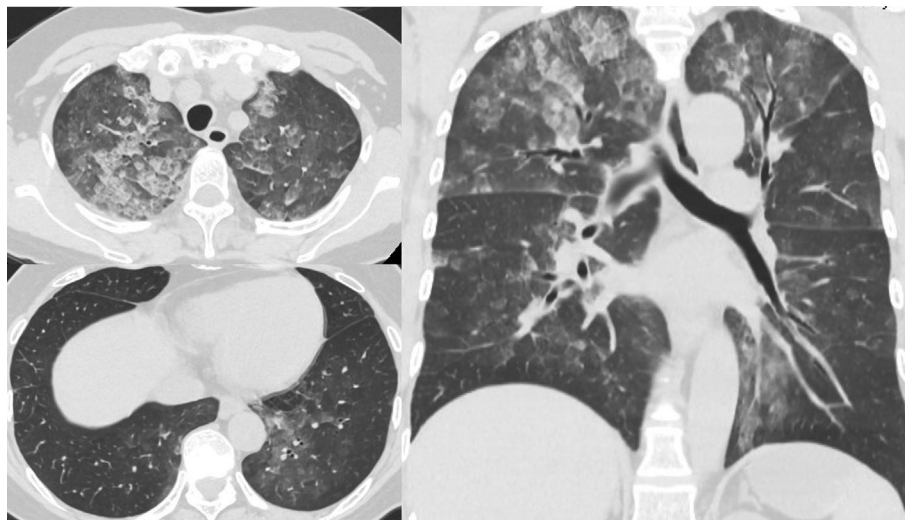


FIGURE 1 Chest computed tomography images on admission. (A) Diffuse centrilobular ground-glass opacities and septal lines in the bilateral upper lung lobes in axial view. (B) Faint ground-glass opacities in the left lower lobe in axial view. (C) Similar findings in coronal view

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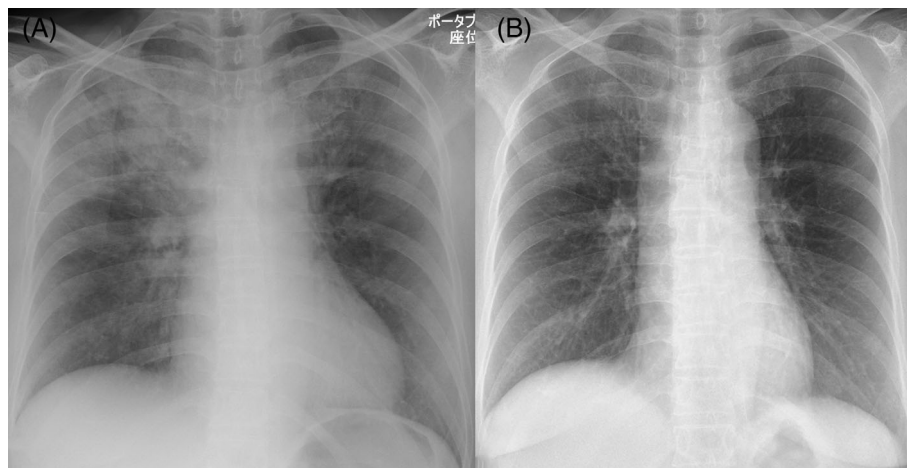


FIGURE 2 A series of chest radiographs show rapid improvement of infiltrative shadow in both upper lungs. (A) Chest radiograph immediately on admission. (B) Chest radiograph on the second day post admission

in which patients develop high negative intrathoracic pressure, in response to upper airway obstruction.¹ To our knowledge, this is the first reported case of COVID-19 with NPPE. NPPE is a condition that is difficult to diagnose unless specifically considered, and it is vital to obtain a medical history.

AUTHOR CONTRIBUTIONS

Satoshi Ikeo conceptualized and drafted the initial manuscript. All authors reviewed and edited the manuscript.

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CONFLICT OF INTEREST

None declared.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ETHICS STATEMENT

Appropriate written informed consent was obtained for the publication of this manuscript and accompanying images.

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