

LETTER TO THE EDITOR

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Successful oxygenation during anesthesia induction using a high-flow nasal cannula in a patient with severe hypoxemia due to lung cancer

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To the Editor,

Tracheal intubation in severe hypoxemia patients remains challenging. Although mask ventilation using an anesthesia circuit can deliver high-concentration oxygen, ventilation must be stopped while attempting tracheal intubation, which may result in deterioration of hypoxemia in respiratory failure patients. Herein, we report a case of successful oxygenation during anesthesia induction using a high-flow nasal cannula (HFNC) in a lung cancer-associated severe hypoxemia patient.

A 64-year-old man (160 cm, 59.2 kg) with a history of upper right lobectomy was scheduled for left lower lobectomy for lung cancer. A week before admission, he presented bloody sputum and exacerbating dyspnea. Preoperative respiratory function tests revealed obstructive respiratory impairment (forced expiratory volume in the first second (FEV1) 1.96 L and FEV1/forced vital capacity ratio 59.6%). He was then admitted to our hospital 1 day preoperatively. On admission, the room-air SpO₂ was 90% and dropped to 85–88% during conversation; it further deteriorated to 82% with coughing. He had severe chest pain due to pleurisy and could not take a deep breath. In the operating room, he was in the lateral position on the bed, and the SpO₂ was 69%. Despite administering 10 L/min oxygen using a face mask, the SpO₂ did not exceed 90%. We decided to apply a HFNC for anesthesia induction. Three minutes after administering oxygen (50 L/min; F_IO₂, 92%) through the HFNC, the SpO₂ was elevated to 98% and maintained at 97–98%. Propofol (120 mg) and rocuronium (50 mg) were administered 4 min later, and the trachea was intubated with a

37-Fr double-lumen tube 2 min after the administration of rocuronium without a drop in the SpO₂.

After intubation, the SpO₂ remained stable and the surgery was completed without further complications. After extubation, the patient was transferred to the intensive care unit. The SpO₂ was maintained at 99–100% using a facemask (O₂, 5 L/min), and the patient was transferred to the surgical ward the day after the surgery.

Accurately placing a double-lumen tube in the trachea takes a longer time compared to a standard tube. While attempting tracheal intubation, oxygen cannot be delivered through a facemask, which might cause desaturation, especially in severe hypoxemia patients. While HFNC has been used in critical care medicine, it has recently gained attention for its potential roles in perioperative settings [1–3]. HFNC has several advantages over conventional oxygen devices. First, it can supply high-concentration oxygen without interfering with transoral procedures such as orotracheal intubation. Second, the high flow rate generates low-level positive airway pressure. A previous study demonstrated that HFNC could maintain oxygenation even in apneic patients for up to 30 min [4]. These HFNC features can be advantageous in cases of tracheal intubation which are expected to take a longer time in severe hypoxemia patients.

In conclusion, HFNC can be useful when tracheal intubation is expected to take a longer time in severe hypoxemia patients.

The patient provided written informed consent for the publication of this case report.

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Abbreviation

HFNC: High-flow nasal cannula

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HS, YD, and TO participated in the care of the patient. YD obtained consent from the patient. HS prepared the manuscript. All authors read and approved the final manuscript.

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Ethics approval and consent to participate

Ethical approval was not required by our institution.

Consent for publication

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Competing interests

None

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