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Journal	JA clinical reports, 6(1): -
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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

Hiroyuki Seki*, Yoshihiko Deguchi, Tomomi Ogihara and Takashi Ouchi

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

Acknowledgements

Not applicable.

Authors' contributions

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.

Funding

This case study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Availability of data and materials

Not applicable.

Ethics approval and consent to participate

Ethical approval was not required by our institution.

Consent for publication

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

Competing interests

None

Received: 10 March 2020 Accepted: 1 April 2020

Published online: 07 April 2020

References

1. Renda T, Corrado A, Iskandar G, Pelaia G, Abdalla K, Navalesi P. High-flow nasal oxygen therapy in intensive care and anaesthesia. *Br J Anaesth*. 2018; 120:18–27.
2. Kurose H, Seki H, Ideno S, Kato J, Morisaki H. High-flow nasal cannula oxygenation during interventional bronchoscopy in a patient with severe tracheal stenosis. *J Clin Anesth*. 2018;46:92–3.
3. Deguchi Y, Seki H, Taaki H, Ouchi T. Successful airway and anesthesia management using a high-flow nasal cannula in a fibrodysplasia ossificans progressiva patient during general anesthesia: a case report. *A A Practice*. 2020;14:75–8.
4. Gustafsson IM, Lodenius A, Tunelli J, Ullman J, Jonsson FM. Apnoeic oxygenation in adults under general anaesthesia using transnasal humidified rapid-insufflation ventilatory exchange (THRIVE) – a physiological study. *Br J Anaesth*. 2017;118:610–7.

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