

# Two Different Endoscopic Procedures Made Feasible by the Janus Mask in a High-Risk Patient

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## Abstract

The Janus mask is a full face mask designed for providing noninvasive ventilation (NIV) during any kind of upper endoscopies (e.g., fiber-optic bronchoscopy, gastrointestinal endoscopy, and transesophageal echocardiography). Due to its unique conformation, its use can be considered for both elective and urgent endoscopic procedures in high-risk patients. In this case report, we present a patient with acute respiratory failure who underwent two consecutive different endoscopic procedures (fiber-optic bronchoscopy and gastrointestinal endoscopy) during continuous positive airway pressure support by means of this novel NIV mask, thus avoiding tracheal intubation and at the same time, improving his respiratory condition.

**Keywords:** Acute respiratory failure, fiber-optic bronchoscopy, intensive care, noninvasive ventilation, upper endoscopy

## INTRODUCTION

Fiber-optic bronchoscopy, gastrointestinal endoscopy, and transesophageal echocardiography are commonly performed worldwide with diagnostic or therapeutic aims. Noninvasive ventilation (NIV) plays a pivotal role in the prevention and management of acute respiratory failure (ARF).<sup>[1-5]</sup> In high-risk patients, upper endoscopic procedures by themselves or due to the need of sedation can lead to or worsen ARF with the need of preventive or urgent tracheal intubation.<sup>[6,7]</sup> The possibility to perform these procedures while maintaining NIV could be an obvious and appropriate solution. Since now, this was challenging as traditional masks for NIV do not allow the introduction of the probe into the patient's mouth or nose.<sup>[8]</sup>

“Janus” (Biomedical Srl, Florence, Italy) is a new full face mask that allows NIV during upper endoscopies. It can be placed prior or during the procedure without removing the endoscopic probe.<sup>[9-11]</sup>

To the best of our knowledge, this is the first report describing its clinical use for two different procedures in the same high-risk patient.

## CASE REPORT

A 56-year-old male with chronic obstructive pulmonary disease, arterial hypertension, and hepatitis B underwent total

gastrectomy with esophagojejunal anastomosis for gastric adenocarcinoma. Two years later, a relapse of gastric cancer developed on the anastomosis. For this reason, resection of the anastomosis, distal esophagectomy, and wedge resection of pulmonary parenchyma were performed, with a new esophagojejunal anastomosis.

Eight days after being discharged from hospital, he referred to our emergency department because of dysphagia, fever (39°C), and productive cough. At hospital admission, he was hypoxic (SpO<sub>2</sub> 91% on room air) but hemodynamically stable. Blood tests revealed anemia (Hb 8.6 g/dl) and elevated C reactive protein level (347.7 mg/L). A computed tomography scan diagnosed bilateral pneumonia, pneumomediastinum, and anastomotic dehiscence of the esophagojejunal anastomosis. To better investigate the state of the anastomosis, the respiratory tract, and to eventually treat the dehiscence, fiber-optic bronchoscopy and gastrointestinal endoscopy were scheduled. Before proceeding with such endoscopic procedures, the patient became dyspneic in spontaneous breathing with Venturi

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mask (FiO<sub>2</sub> 50%). The arterial blood gas analysis showed pH 7.53, PaCO<sub>2</sub> 33.1 mmHg, PaO<sub>2</sub> 60 mmHg, BE 4.6 mmol/L, lactate 1.28 mmol/L, SpO<sub>2</sub> 90.3%, and a PaO<sub>2</sub>/FiO<sub>2</sub> ratio of 120 mmHg.

The endoscopic procedures were thus performed under continuous positive airway pressure (CPAP) support using the Janus mask with a FiO<sub>2</sub> of 50% and a positive end-expiratory pressure of 5 cmH<sub>2</sub>O.<sup>[12]</sup> At the time of the procedures, the patient was fasting for 6 h. To facilitate the operators' ease of work and to limit the patient's discomfort, mild sedation with propofol was used. The procedures lasted 28 min overall and a total dose of 410 mg of propofol was administered [Figure 1]. Throughout all the procedures, the patient remained hemodynamically stable and in spontaneous breathing. The arterial blood gas analysis drawn just after awaking and before removing the Janus mask showed pH 7.37, PaCO<sub>2</sub> 49.8 mmHg, PaO<sub>2</sub> 174.1, BE 2.8 mmol/L, lactate 1.23 mmol/L, SpO<sub>2</sub> 98.2%, and PaO<sub>2</sub>/FiO<sub>2</sub> 348 mmHg.

The endoscopic procedure confirmed the anastomotic dehiscence and identified a double bronchial fistula. The day after the patient underwent the resection of the anastomosis, cervical esophagostomy, bronchial fistulas repair, and nutritional digiunostomy.

The patient was discharged 44 days after surgery in good conditions.

A written informed consent for scientific management of data and images were obtained.

## DISCUSSION

In the present case report, we describe how a gastrointestinal endoscopy and a fiber-optic bronchoscopy were successfully performed in a hypoxic and sedated patient during CPAP support, without interrupting it. This was made feasible thank to a new available mask for NIV (called "Janus") that allows to perform upper endoscopic procedures during NIV.<sup>[9-12]</sup> The



**Figure 1:** Gastrointestinal endoscopy performed through the Janus full face mask for noninvasive ventilation

hole in the middle of the mask permits the introduction of the endoscopic probe into the mouth or the nose of a patient without interrupting the NIV support and with only minimal and nonrelevant air leakage around the probe. At the same time, as the mask can be opened in two halves, it can be placed on a patient's face even during an already ongoing endoscopic procedure if he requires NIV support for any cause. Obviously, the Janus mask can be also used as a traditional full face mask for NIV regardless of upper endoscopies as the hole can be closed with an appropriate cap.<sup>[9,10]</sup> Since our patient had a sudden ARF due to pneumonia and pneumomediastinum, tracheal intubation could be an option to perform the endoscopic procedures safely. Anyway, he should have been transferred to the Intensive Care Unit (ICU) because it would have been impossible to extubate the patient after the procedures. In consideration of the limited availability of ICU beds, we succeeded to keep the patient in spontaneous breathing whereas maintaining adequate oxygen saturation with the Janus mask without adverse events.

## CONCLUSION

We described how the Janus full face mask allowed to safely perform both a fiber-optic bronchoscopy and a gastrointestinal endoscopy during CPAP support in a patient with ARF, thus avoiding ARF worsening and the need for tracheal intubation.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Nava S, Hill N. Non-invasive ventilation in acute respiratory failure. *Lancet* 2009;374:250-9.
2. Cabrini L, Antonelli M, Savoia G, Landriscina M. Non-invasive ventilation outside of the Intensive Care Unit: An Italian survey. *Minerva Anesthesiol* 2011;77:313-22.
3. Cabrini L, Landoni G, Oriani A, Plumari VP, Nobile L, Greco M, *et al.* Noninvasive ventilation and survival in acute care settings: A comprehensive systematic review and metaanalysis of randomized controlled trials. *Crit Care Med* 2015;43:880-8.
4. Cabrini L, Plumari VP, Nobile L, Olper L, Pasin L, Bocchino S, *et al.* Non-invasive ventilation in cardiac surgery: A concise review. *Heart Lung Vessel* 2013;5:137-41.
5. Cabrini L, Zangrillo A, Landoni G. Preventive and therapeutic noninvasive ventilation in cardiovascular surgery. *Curr Opin Anaesthesiol* 2015;28:67-72.
6. Tobias JD, Leder M. Procedural sedation: A review of sedative agents, monitoring, and management of complications. *Saudi J Anaesth* 2011;5:395-410.

7. Metzner J, Domino KB. Risks of anesthesia or sedation outside the operating room: The role of the anesthesia care provider. *Curr Opin Anaesthesiol* 2010;23:523-31.
8. Cabrini L, Nobile L, Cama E, Borghi G, Pieri M, Bocchino S, *et al.* Non-invasive ventilation during upper endoscopies in adult patients. A systematic review. *Minerva Anesthesiol* 2013;79:683-94.
9. Cabrini L, Landoni G. A novel non-invasive ventilation mask to prevent and manage respiratory failure during fiberoptic bronchoscopy, gastroscopy and transesophageal echocardiography. *Heart Lung Vessel* 2015;7:297-303.
10. Zangrillo A, Mazzone P, Votta CD, Villari N, Della Bella P, Monaco F. Prolonged transesophageal echocardiography during percutaneous closure of the left atrial appendage without general anesthesia: The utility of the Janus mask. *Can J Anaesth* 2016;63:962-5.
11. Bove T, Votta CD, Ciriaco P, Pappalardo F, Oriani A, Frau G, *et al.* Bronchoscopy during non-invasive ventilation in a patient with acute respiratory distress syndrome. *Signa Vitae* 2017;13:103-4.
12. Cabrini L, Isabella Savia MD, Margherita Bevilacqua MD, Domenico Votta C, Martina Filippini MD, Giovanni Landoni MD, *et al.* Continuous positive airway pressure during upper endoscopies: A bench study on a novel device. *J Cardiothorac Vasc Anesth* 2016;30:e43-5.