

An Alternative Way to Manage Intraoperative Tear of Cuff Inflation Line of the Endotracheal Tube during Ophthalmic Surgery

Dear Editor,

Loss of endotracheal cuff pressure is uncommon during general anesthesia. It can lead to airway compromise and aspiration, requiring immediate intervention. Loss of endotracheal cuff pressure can be caused by a defective inflation system, including endotracheal tube (ETT) cuff, valve, pilot balloon, and inflation line.¹ The management often requires exchanging the ETT.^{2,3} Here, we present a case of loss of endotracheal cuff pressure, managed successfully with a self-assembly syringe inflator.

The case is a 77-year-old female with a history of hypertension. She was diagnosed with an orbital wall fracture and scheduled for orbital fracture repair surgery under general anesthesia in our medical center in Taiwan. Before induction, a thorough preuse check of the ETT was done, and the tube was found safe to use. After induction, the trachea was intubated smoothly with a 6.5 mm (ID) flexometallic ETT (Omnimate, Taiwan). However, 15 min later, the bellow of the ventilator dropped slowly. The ventilator was checked, and no leak was reported. The pilot balloon was found to lose pressure subtly. We adjusted the ventilator parameters to a lower tidal volume of 4–5 mL/kg combined with a higher frequency above 20 breaths per minute to maintain adequate ventilation. We increased the oxygen flow from 1 L/min to 2 L/min with 50% oxygen. To avoid significant respiratory circuit leaks, we must also reinflate the ETT cuff every 10 min. To facilitate reinflation, we connect the pilot balloon and the syringe with a 2-m extension set (Innovative, SHIH.N, Taiwan) [Figure 1].

We can reinflate the cuff through the self-assembly syringe inflator. After 90 min since induction, the operation was finished uneventfully. After extubation, a minor leak point was found on the proximal part of the inflation line with water injection [Figure 2].

As emphasized in the previous study, a thorough preuse check of ETTs has to be done before every time of general anesthesia.¹ Anesthetists should check the cuff to ensure it inflates symmetrically and is not damaged.¹ In addition, the cuff leakage might be checked by negative pressure testing. However, the leak of the inflation system in our case was too tiny to be found preoperatively. Sometimes, the leak may be caused by the surgeon intraoperatively.^{2,3} Loss of endotracheal cuff pressure can cause a leak of the respiratory circuit, which leads to airway compromise and inadequate depth of anesthesia. The management depended on the severity of the respiratory circuit leak, the type of surgery, and the expected operation

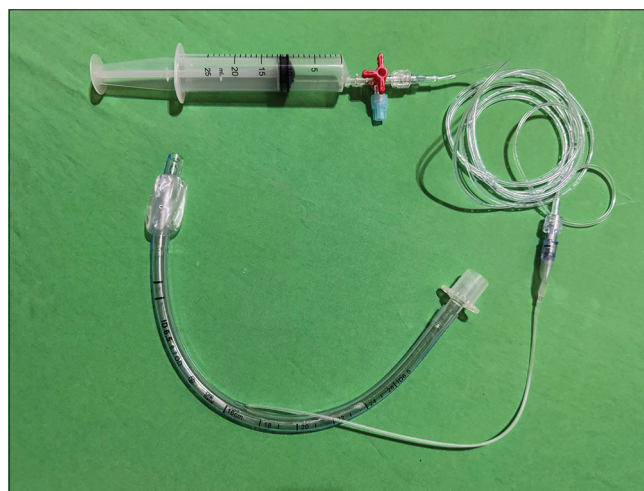


Figure 1: The pilot balloon of the endotracheal tube was connected to the syringe with a 2-m extension set

time. Exchanging the ETT is often necessary, interrupting the operation and increasing the infection rate due to breaking the sterile field. Considering the low severity of the leak, the stable patient's condition, and the expected short operating time, we decided not to exchange the ETT. Other methods of reinflation of the cuff have been reported in previous studies.^{4,5} The previously reported methods usually involved cutting the inflation line, which might completely deflate the cuff and increase the risk of aspiration. Our self-assembled syringe inflator allows adequate endotracheal cuff pressure without destroying the remaining inflation system and interrupting the operation. The defect is that we have to reinflate the cuff every 10 min to keep the cuff pressure at 20–30 cm H₂O by a cuff pressure monitor to prevent possible aspiration and secondary airway injury.⁶ Our experience could be that of educating and considered as an alternative solution to facing similar situations. However, it may be inappropriate in long-term surgery.

Ethical approval statement

This study proposal was approved by the Institutional Review Board of Tri-Service General Hospital, National Defense Medical Center with the approval number: C202415002, approval date: 2024/01/06. The study was performed in accordance with Declaration of Helsinki.

Declaration of patient consent

The authors certify that they have obtained all appropriate

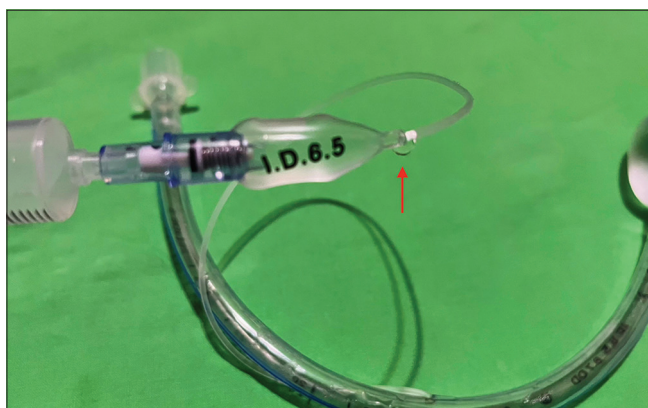


Figure 2: A minor leak point was found on the proximal part of the inflation line with water injection (arrow)

patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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We thank the patient for signing the informed consent for publication of the report and associated images.

Data availability statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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