



Unforeseen complications: towel clip-induced pilot balloon injury resulting in endotracheal tube cuff leak during surgery

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Dear Editor,

Anesthesia, despite the expertise of anesthesiologists, can pose challenges and unexpected complications. We present a rare case wherein a cuff leak occurred during general anesthesia due to a pilot balloon injury caused by a commonly used surgical instrument, the towel clip.

In 2017, a 52-year-old male patient diagnosed with squamous cell carcinoma of the buccal mucosa underwent segmental mandibulectomy and wide local excision with supra-omohyoid neck dissection. Subsequently, due to recurrence, the patient underwent excision and reconstruction using a split skin graft. Currently, the patient presents with microinvasive squamous cell carcinoma of the right retromolar trigone, for which wide local excision and reconstruction with a PMMC flap is planned. The patient had no comorbidities. Upon examination, the patient exhibited an asymmetrical face with scar marks from previous surgical defects on the right side of the mandible. We anticipated a difficult airway due to a 20 mm mouth opening and chin deviation to the right side, with no restricted neck movements.

Preoperatively, the patient underwent preparation for awake nasal fiberoptic intubation, including nebulization of 4 ml of 4% lignocaine and an injection of glycopyrrolate. Additionally, a superior laryngeal nerve block and transtracheal injection of 2 ml of 2% lignocaine were administered. Intubation using fiberoptic bronchoscopy was successful on the first attempt. The patient was induced and ventilated with 450 ml, ET_{CO₂} at 35 cm H₂O, and a gas flow of 2 liters, then handed over to the surgeon. After one hour, the patient exhibited signs of cuff leakage, including decreased tidal volume, increased ET_{CO₂}, tachycardia, and hypertension, necessitating urgent intervention. Investigation revealed an inadvertent puncture of the pilot balloon of the endotracheal tube with a towel clip (Fig. 1, 2, 3). We applied Io-Ban on both sides of the balloon and inflated it to a cuff pressure of 20–30 cm H₂O. Changing the endotracheal tube was challenging due to the difficult and shared airway. However, after applying the Io-Ban, the cuff pressure remained between 20–30 cm of H₂O with no signs of air leak. Throughout the six-hour surgery, gas

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Fig. 1. The pilot balloon injury caused by a commonly used surgical instrument, the towel clip.



Fig. 2. The towel clip.



Fig. 3. The towel clip damaging the pilot balloon that was hidden inside the drape.

flow was maintained at 2 liters for controlled ventilation. Swift action was taken to recognize and address the cuff leak. Intraoperative tidal volume and ETCO_2 were monitored, with the cuff leak checked at hourly intervals

and pressure maintained. Subsequently, the surgery proceeded uneventfully. The patient was safely extubated, and the postoperative course was uncomplicated, with no adverse respiratory sequelae.

Careful handling and manipulation of the tube were executed to prevent inadvertent damage to the balloon, a crucial precaution due to the substantial risk tube exchange poses to patients with challenging airway conditions. The shared surgical field further complicates access. In instances where tracheal reintubation or tube exchange present challenges, preserving the pilot balloon cuff to prevent cuff deflation can be implemented until the procedure concludes [1]. Various methods for averting such mishaps have been documented in the literature. A distinctive approach to preventing cuff deflation when the tubing to the pilot cuff balloon sustains damage during ongoing surgery involves inserting an intravenous cannula into the severed end of the cuff inflation tube [2]. This enables reinflation using a syringe, while a stopcock establishes a seal to prevent deflation. Another technique, as described by Rao et al., entails

inserting the severed tubing end into the locking adaptor of the epidural connector and a three-way stopcock [3]. Temporary measures, such as inflating the cuff with a viscous substance like lidocaine jelly, have also been outlined [4]. In cases of minor tears, the cuff may initially inflate, but gradual air seepage through the perforation eventually leads to complete deflation. Regardless of the chosen method, ensuring an adequate seal is imperative to restore cuff pressure and mitigate risks of aspiration and subglottic injury.

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