



Case Report

Air-Q laryngeal airway for rescue and tracheal intubation ^{☆, ☆☆☆, ★, ★★, ☆☆☆}



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Abstract We report the successful use of the Air-Q laryngeal airway (Air-Q LA) as a ventilatory device and a conduit for tracheal intubation to rescue the airway in a patient with difficult airway and tracheal stenosis. This is the first case report of the device to secure the airway after two episodes of hypoxemia in the operating room and intensive care unit. Consent for submission of this case report was obtained from our institution's human studies institutional review board given that the patient died a few months after his discharge from the hospital before his personal consent could be obtained and before preparation of this report. All personal identifiers that could lead to his identification have been removed from this report. A 59-year-old man was scheduled for a flexible and rigid bronchoscopy with possible laser excision of tracheal stenosis. He had a history of hypertension, atrial fibrillation, and diabetes. Assessment of airway revealed a thyromental distance of 6.5 cm, Mallampati class II, and body weight of 110 kg. He had hoarseness and audible inspiratory/expiratory stridor with SpO₂ 90% breathing room air. After induction and muscle relaxation, tracheal intubation and flexible bronchoscopy were achieved

[☆] Ayman Ads, MD: I was the attending anesthesiologist assigned to this patient's surgical procedures during his 2 admissions including the laser excision of the patient's tracheal stenotic lesion and tracheostomy. I also supervised Dr Frederic Auerbach, the resident/co-author no. 2 during this admission. In collaboration with Dr el-Ganzouri (co-author no. 4), I wrote the discussion and conclusion sections of this case report article and provided input and revisions to the rest of the case report drafted by Drs Auerbach and Kelly Ryan (co-author no. 3).

^{☆☆} Frederic Auerbach, MD: I was the junior anesthesiology resident assigned to this patient during his 2 admissions. I prepared the draft of the case description section of this case report.

[★] Kelly Ryan, MD: I was the senior anesthesiology resident who inserted the Air-Q Laryngeal Airway and performed tracheal intubation through the device after his emergent accidental extubation during his stay in the surgical intensive care unit after his first surgical procedure. I prepared the portion of the draft of the case description section of this case report that pertained to this event in the surgical intensive care unit and about the patient's subsequent course until he was weaned off the ventilator.

^{★★} Abdel R. El-Ganzouri, MD: I prepared the discussion and conclusion sections of the case report with Dr Ads, the primary author. I also provided editorial input in the revisions of the rest of the case report.

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without incident. The patient was then extubated and a rigid bronchoscopy was attempted but failed with SpO₂ dropping to 92%; rocuronium 60 mg was given, and reintubation was accomplished with a 7.5-mm endotracheal tube. A second rigid bronchoscopy attempt failed, with SpO₂ dropping to 63%. Subsequent direct laryngoscopy revealed a bloody hypopharynx. A size 4.5 Air-Q LA was placed successfully and confirmed with capnography, and SpO₂ returned to 100%. The airway was suctioned through the Air-Q LA device, and the airway was secured using a fiberoptic bronchoscope to place an endotracheal tube of 7.5-mm internal diameter. The case was canceled because of edema of the upper airway from multiple attempts with rigid bronchoscopy. The patient was transported to the surgical intensive care unit (SICU). During day 2 of his SICU stay, he accidentally self-extubated and SpO₂ dropped to 20% prompting a code blue call. A size 4.5 Air-Q LA was successfully placed by the anesthesia resident on call and SpO₂ rose to 100%. The airway was then secured after suction of bloody secretions and visualization of edematous vocal cords with a fiberoptic bronchoscope and proper placement of an endotracheal tube of 7.5-mm internal diameter, confirmed by capnography. During the short period of hypoxemia, the patient's blood pressure, heart rate, and electrocardiogram had remained stable. On the sixth day of SICU admission, he underwent surgical tracheostomy and laser excision of a stenotic tracheal lesion, returned to the SICU, was weaned off mechanical ventilation, and discharged 2 weeks later to a rehabilitation center with stable ventilatory capabilities. This case demonstrates successful use of the Air-Q LA in the emergency loss of airway scenario as a ventilatory device and as a conduit for endotracheal intubation when fiberoptic bronchoscopy alone may be difficult and hazardous. This case suggests the need for further evaluation of the impact of the Air-Q LA on outcomes when used as a rescue device and conduit for tracheal intubation in patient with disease activity.

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1. Introduction

A 59-year-old man scheduled for YAG Laser excision of tracheal stenosis developed 2 episodes of hypoxemia after failed rigid bronchoscopy in the operating room (OR) and again after accidental self-extubation in the surgical intensive care unit (SICU). Use of the Air-Q laryngeal airway (Air-Q LA) resulted in immediate adequate oxygenation, and tracheal intubation (TI) was established with uneventful recovery after both episodes.

2. Case

A 59-year-old man with a history of hypertension, insulin-dependent diabetes, and atrial fibrillation was hospitalized for arrhythmia treatment with subsequent 2 months of tracheal intubation and failure to wean from mechanical ventilation. He underwent a tracheostomy that was subsequently reversed and was discharged home. Six months later, he presented to the thoracic surgical clinic complaining of shortness of breath. After flexible laryngoscopy revealed 50% mid-tracheal stenosis (subglottic, intraluminal), he was scheduled for a flexible and rigid bronchoscopy, with possible dilation and laser excision of the tracheal stenosis.

On the day of surgery, he had an audible inspiratory/expiratory stridor. His preoperative vital signs were SpO₂ 90% on room air, blood pressure of 132/62 mm Hg, heart rate of 65, and respiratory rate of 24. Preoperative airway assessment [1,2] revealed interincisor gap greater than 4 cm,

head/neck movement greater than 90°, ability to prognath, a thyromental distance of 6.5 cm, body weight of 114 kg, no history of difficult intubation, and Mallampati class II, indicating a difficult airway.

Before transport to the OR, the patient was administered 1 mg of midazolam intravenously (IV) and standard Adaptive Security Appliance monitors were placed. After preoxygenation for 5 minutes, SpO₂ was 100%. After prepping and draping of the patient's neck in anticipation of a possible emergent cricothyroidotomy, induction of anesthesia was accomplished with administration of IV fentanyl 150 µg, propofol 200 mg, and succinylcholine 160 mg; and intubation was completed after bag-valve-mask ventilation. An endotracheal tube (ETT) of 8.5-mm internal diameter (ID) was successfully placed using a MacIntosh 4 blade. The ETT was placed above the location of tracheal stenosis; the cuff was inflated with 6 cc air, and the ETT's proper placement was confirmed by positive end-tidal CO₂ tracing and bilateral breath sounds. Anesthesia was initiated with remifentanyl infusion and sevoflurane (0.5 minimum alveolar concentration).

An initial attempt to perform rigid bronchoscopy, first alongside the ETT and, secondly, after removal of the ETT upon surgeon request, failed. When the patient's SpO₂ dropped to 92%, 60 mg rocuronium was administered for neuromuscular blockade and the patient was successfully reintubated after 2 attempts with a 7.5-mm-ID ETT using a MacIntosh 4 blade. This smaller diameter tube permitted passage beyond the mid-tracheal stenosis. After positive pressure ventilation, the SpO₂ was 100%. Another attempt to perform rigid bronchoscopy failed, at which time the SpO₂ dropped to 63%. A size 4.5 Air-Q LA was promptly inserted,

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