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Supraglottic Jet Oxygenation and Ventilation (SJOV) to Assist Emergent Resection of a Large Vocal Cord Tumor Using Suspension Laryngoscopy

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ABSTRACT

Supraglottic Jet Oxygenation and Ventilation (SJOV) is a minimally invasive ventilation technique which can be used in a variety of clinical settings. İn this case report we describe the use of SJOV to assist with emergent resection of a large vocal cord tumor to assist in suspension laryngoscopy.

INTRODUCTION

A 63-year-old female patient presented to our hospital emergency room with progressive dyspnea. Her past medical history was significant for chronic tobacco use, COPD and vocal cord polyps. The patient was diagnosed with a severe respiratory depression due to an obstructing left vocal cord mass (Video 1) and scheduled for an emergent laryngoscopy and resection of the tumor. Physical exam revealed a Mallampati score of I, full range of motion in neck, good mouth opening and a BMI of 24.8. Other notable findings included tachypnea and inability to lie flat. An approach was developed in preoperative discussion between surgical and anesthesia teams to use total intravenous general aesthesia (TIVA) plus rocuronium, with supraglottic jet oxygenation and ventilation (SJOV) (Figure 1) to assist in suspension laryngoscopy for resection of the vocal cord tumor. The rescue plan was to be an emergent tracheal intubation with a small endotracheal tube, with additional backup plan of emergent tracheostomy. In addition to general anesthesia, the patient was also consented for the use of photos and videos of the procedure for educational purposes. Her vital signs before anesthesia induction: RR 22, SaO2 98%, HR 95, BP 160/80. Induction medicines included 60mg lidocaine, 100mg propofol, 80mg rocuronium. Anesthesia was maintained via propofol infusion at 100 mcg/kg/min. SJOV was provided by inserting a suction catheter connected to an Acutronic Jet Ventilator into a regular nasal trumpet lumen. The settings were RR: 100/min, driving pressure 20 Psi, I/E ratio 40. (video 2). SpO2 was maintained above 98% during the procedure and PetCO2 was not measured. The patient was hemodynamically stable during the procedure. The tumor was resected in 11 minutes successfully. The patient emerged from anesthesia smoothly and recovered well after surgery.

SJOV has been used successfully to rescue a patient with emergent cannot intubate and cannot ventilate airway management [1]. SJOV also provided adequate oxygenation/ventilation during emergent fiberoptic intubation in

a paralyzed morbidly obese patient with obstructive sleep apnea after failed intubation with a video laryngoscope [2].

Figure 1

The new guideline on difficult airway management by the American Society of Anesthesiologists (ASA) in 2022 mentioned SJOV to be a potential approach during emergent difficult airway management [3], although more studies are necessary to confirm its usefullness and potential side effects. Compared to transtracheal jet ventilation (TTJV), SJOV is easy to set up, to learn and to practice in patients. The method carries a high rate of success and minimal risks of barotrauma (pneumothorax etc.) [4-11]. SJOV has been demonstrated to provide significantly better oxygenation than a traditionally used regular nasal cannula or a face mask with IV propofol infusion for upper GI endoscopy6 and hysteroscopy in morbidly obese patients10. SJOV is considered to have the following advantages compared to a traditionally used small endotracheal tube with a conventional mechanical ventilator (CMV) in the management of cases like the presented one: easy and quick to set up and minimal interference with surgical resection of a vocal cord tumor. The disadvantage is the lack of monitoring of various ventilation parameters including PetCO2 using the present assembly of suction catheter and regular nasal trumpet to perform SJOV. However, PetCO2 could be monitored conveniently using WEI Nasal Jet Tube (WNJ) in previous studies [2,4,7,8,10]. There is a potential that PaCO2 may be increased during the procedure, but it is expected to be in the tolerable level considering the short duration of this procedure. This potential risk however should be carefully considered especially in patients with obesity.

The patient consented to full use of health information for research and educational purposes for this case report.

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