Case Report

Anesthetic Management for Laser Excision of Ball-Valving Laryngeal Masses

Benjamin B. Bruins,1 Natasha Mirza,2 Ernest Gomez,3 and Joshua H. Atkins4

1Department of Anesthesiology & Critical Care, Hospital of the University of Pennsylvania, Philadelphia, PA 19104, USA
2Department of Otorhinolaryngology, Head and Neck Surgery, Perelman School of Medicine, The University of Pennsylvania, Philadelphia, PA 19104, USA
3Department of Otorhinolaryngology, Head and Neck Surgery, Hospital of the University of Pennsylvania, Philadelphia, PA 19104, USA
4Department of Anesthesiology & Critical Care, Department of Otorhinolaryngology, Head and Neck Surgery, Perelman School of Medicine, The University of Pennsylvania, PA 19104, USA

Correspondence should be addressed to Joshua H. Atkins; atkinsj@uphs.upenn.edu

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A47-year-old obese woman with GERD and COPD presents for CO2-laser excision of bilateral vocal fold masses. She had a history of progressive hoarseness and difficulty in breathing. Nasopharyngeal laryngoscopy revealed large, mobile, bilateral vocal cord polyps that demonstrated dynamic occlusion of the glottis. We describe the airway and anesthetic management of this patient with a topicalized C-MAC video laryngoscopic intubation using a 4.5 mm Xomed Laser Shield II endotracheal tube. We examine the challenges of anesthetic management unique to the combined circumstances of a ball-valve lesion and the need for a narrow-bore laser compatible endotracheal tube.

1. Introduction

Airway management of the patient with a glottic lesion producing dynamic total airway occlusion (ball-valve effect) requires a specialized management plan [1]. Induction of general anesthesia, loss of hypopharyngeal tone, abolition of spontaneous ventilation, and initiation of positive pressure ventilation can result in the inability to ventilate and/or intubate. For these reasons, airway management in patients with large or periglottic airway masses is often accomplished with awake or minimally sedated fiberoptic bronchoscopic endotracheal tube placement [2, 3]. The added requirement for laser surgery at the glottis around a narrow-bore (<6 mm) endotracheal tube limits this approach. We describe successful topicalized-sedated intubation with Storz C-MAC (Karl Storz, Tuttingen, Germany) videolaryngoscopy and characterize technical limitations associated with blind techniques and laser tubes.

The patient gave written consent for publication of the details of the case.

2. Case Description

A 47-year-old, obese (BMI 33) woman with GERD, COPD, and 60-pack year smoking history presented to the operative theater for CO2-laser excision of bilateral vocal fold polyps. Home medications included a proton pump inhibitor and inhaled beta-2 agonist. Preoperative nasopharyngeal laryngoscopy revealed a left highly mobile polyp that herniated from a supraglottic position during expiration to a subglottic position during inspiration and a smaller right polyp. Airway occlusion was estimated at 70–80% by the surgical team as depicted in video 1 in Supplementary Material available online at http://dx.doi.org/10.1155/2015/875053. The patient declined tracheostomy and was scheduled for
an elective resection of the polyps in the operating room. Physical examination revealed full neck mobility, the ability to sublux her mandible, intact dentition, 3 cm mentohyoid distance, 4 cm interincisor distance, and Mallampati score of 1. History was significant for hoarseness and an exaggerated gag reflex. The surgical plan was mass excision employing the CO₂-laser and a 4.5 mm laser-resistant endotracheal tube was requested to facilitate exposure.

Nebulized lidocaine (2%, 8 mL, 8 L/min) was administered in the holding area over 15 minutes. The patient was brought to the operating room, positioned 40 degrees head-tered in the holding area over 15 minutes. The patient was requested to facilitate exposure.

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across the lesion for oxygen delivery would be one rescue option. Rigid bronchoscopy and formal awake tracheostomy should be considered as alternative strategies. Awake videolaryngoscopy (VL) offers a safe and practical approach to intubation, preserving the ability to visualize the glottis, the lesion, and movements of the endotracheal tube during intubation. The entire surgical and anesthesia team can follow the intubation in an effort to maximize safety and facilitate immediate expert input should intubation prove challenging. A growing body of evidence supports awake VL or combined awake VL and fiberoptic guidance for complex airway management [6–9]. Each respective VL technique offers unique advantages. For a glottic lesion it is important to visualize the tip of the blade as it transits towards the larynx. The GlideScope (Verathon Medical, Bothell, WA) does not allow for continuous distal tip visualization [10]. Stylet options are also important. The traditional rigid GlideScope stylet, recommended for most intubations, cannot pass through a 4.5 ID laser tube. Some devices such as the PENTAX Airway Scope (AWS, Ambu A/S, Ballerup, Denmark) offer an intubating channel that eliminates the need for a stylet altogether but are recommended to use with a straight blade approach that might not be suitable for all lesions. Similarly when using some devices it can be challenging to reliably introduce suction directly to the area of the glottis to clear bleeding or secretions during laryngoscopy. We selected the Storz CMAC VL for the ability to continuously visualize the tip of the blade, reliably deliver surgical suction to the glottis if bleeding should occur, and use a narrow, malleable stylet if needed.

Various approaches to patient sedation and airway preparation for awake laryngoscopy have been described and largely parallel those adopted for fiberoptic intubation. Dexmedetomidine is a useful sedative in this setting as respiratory depression is minimal and patients retain the ability to follow commands, including deep inspiration and expiration that promote opening of the airway. Dexmedetomidine decreases sympathetic circulating norepinephrine levels and is associated with bradycardia [11]. Remifentanil is also associated with bradycardia and laryngoscopy exerts a profound stimulus of vagal activity. We believe that the drug combination along with the self-reported history of a profound gag reflex and the receding effects of topical lidocaine 60 minutes into the procedure contributed to the asystole. Pretreatment with an anticholinergic agent should be considered when the combination of dexmedetomidine and remifentanil is used for suspension laryngoscopy.

Conflict of Interests
The authors declare that there is no conflict of interests regarding the publication of this paper.

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