CASE REPORTS

STRAIGHT TO VIDEO: TONSILLAR INJURY DURING ELECTIVE GLIDESCOPE®-ASSISTED PEDIATRIC INTUBATION

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Abstract

Airway management in pediatric patients presenting for tonsillectomy and adenoidectomy may prove challenging given the enlarged upper airway structures. Video Laryngoscopy (VL) can be very helpful but it does not come without risks. In this case report, we report an unfavorable outcome of VL in a pediatric patient with adenotonsillar hypertrophy.

Introduction

Airway management in pediatric patients presenting for tonsillectomy and adenoidectomy may prove challenging given the enlarged upper airway structures. Video Laryngoscopy (VL) as a modality of airway instrumentation has the potential to facilitate an unobstructed view of the vocal cords in situations where the oral, pharyngeal and laryngeal axes are difficult to align. Such may be the case due to body habitus, trauma or neoplasm, among other indications. For this reason, VL is an important tool in the anesthesiologist’s armamentarium. It has been suggested that VL has earned a place high up in an algorithm for dealing with a difficult airway, particularly in a “can’t intubate/can’t ventilate” patient scenario1-3. VL may also be considered in patients where minimizing the force required during laryngoscopy is desirable such as a patient with loose teeth. Even though VL can be very helpful, it does not come without risks. There have been numerous case reports describing injury to various oropharyngeal structures. Hereby, we report an unfavorable outcome of VL in a pediatric patient with adenotonsillar hypertrophy undergoing tonsillectomy and adenoidectomy.

Case Presentation

A 6-year old female with comorbidities of sickle cell disease and a history of numerous blood transfusions presented for elective tonsillectomy-adenoidectomy due to obstructive sleep apnea. Preoperative airway examination revealed Mallampati Class I with full range of neck

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and jaw mobility, adequate thyro-mental distance, and as expected, enlarged tonsils. In addition to tonsillar hypertrophy, it was noted that the patient had loose upper incisors about which the parent was very concerned. The anesthesia team decided to use GlideScope® Cobalt AVL for endotracheal intubation in an effort to avoid inadvertent pressure or traction on the loose teeth.

After the induction of anesthesia, endotracheal intubation was attempted by the anesthesiology resident with the GlideScope®. A Cormack Lehane grade I laryngoscopic view was easily achieved with a size 2 GlideScope® blade. A 6.0 internal diameter (ID) oral RAE endotracheal tube, without stylet, was unsuccessfully introduced to the oropharynx. The rigid GlideRite® stylet was not used during the initial attempts to pass the endotracheal tube because when inserted into the endotracheal tube, the tip of the stylet protruded beyond the end of the oral RAE endotracheal tube. The RAE endotracheal tube of ID 6.0 mm was removed, and it was noted that blood was present on the tip of the endotracheal tube.

Mask ventilation was resumed with oxygen and sevoflurane and at this time, it was much more difficult to manually ventilate than during induction despite head-tilt-chin-lift and jaw thrust maneuvers. A subsequent attempt at VL by the supervising anesthesiologist revealed that the tonsils were almost completely obstructing the laryngoscopic view. Further attempts at intubation were withheld, and assistance was sought from the otorhinolaryngology surgical team due to the apparent injury to the enlarged tonsils during the initial intubation attempt.

The examination by the otorhinolaryngologist revealed Brodsky Grade 4+ tonsils with one partially detached tonsil having minimal mucosal bleeding. Endotracheal intubation was achieved by an attending physician with a Miller 2 blade with no observable effect to the loose teeth. At this time, the decision was made to proceed with the tonsillectomy-adenoidectomy as planned. After discussion with the concerned parent, the loose tooth was removed by the attending dentist. The remainder of the peri-operative course was unremarkable.

Discussion

Even though VL has been shown to improve the ability of novices to obtain laryngeal exposure when compared to Direct Laryngoscopy (DL) in adults⁴, there is evidence for and against ease of use with respect to pediatric patients. Fonte et al⁵ demonstrated that pediatric residents, who were unfamiliar with VL, failed at tracheal intubations at a higher rate while using VL than when performing DL with a Miller blade in pediatric patients with a normal airway or tongue edema. Ilies et al⁶ found no difference between an attending physician’s and an experienced resident’s ability to obtain an improved view of vocal cords using VL after DL. Despite a perceived disadvantage to using VL for tracheal intubation by novices, it has been shown that in the hands of experienced anesthesiologists, VL does improve the ability to successfully intubate pediatric patients⁸-¹⁰. VL may prove to be a useful tool in obtaining laryngeal exposure, but there have been numerous reports of injury to various oropharyngeal structures in adults including abrasion, perforation and laceration of tonsils, palatopharyngeal wall, lingual nerve as well as dental injury¹¹-¹⁸. It has been suggested that both the blind insertion and pathway of the endotracheal tube and the rigid stylet may be contributing factors to oropharyngeal injury during VL¹⁹-²⁰.

Although the decision for airway instrument choice was ultimately influenced by the patient’s dentition rather than a perceived difficult airway (even though the loose tooth was eventually removed by a dentist), this case shows one instance wherein use of GlideScope® for pediatric endotracheal intubation may have contributed to more harm than good. Even if the rigid stylet is not used to facilitate intubation, there is an inherent risk of oropharyngeal injury when using the video laryngoscope due to the inability to visualize the endotracheal tube passing from the opening of the mouth to the point where it enters the field of focus of the camera lens.

The Glidescope® has become a popular tool among peri-operative, critical care and emergency room care providers. Few would dispute that it has earned a place in the American Society of Anesthesiologists’ Difficult Airway Algorithm²¹ which
states that providers managing difficult airway should give appropriate considerations to the comparative benefits vs. workability potential of options including VL as the initial intubation attempt. In the presence of a known pharyngeal mass it may be worth considering DL, flexible fiberoptic (FFO) bronchoscope or a combination of VL and FFO used in conjunction as described by Weissbrod and Merati. We would also recommend caution when using the video laryngoscope for educational purposes. Although VL may facilitate both trainer and trainee to visualize the vocal cords in pediatric patients, its use may increase the risk of oropharyngeal injury or failed intubation in inexperienced hands.

**Conclusion**

In summary, operators’ tendency to direct and focus their attention ‘Straight To Video’ in VL should be cautioned against in order to avoid potential oropharyngeal injuries along the route of blind insertion of the endotracheal tube from the angle of the mouth until it becomes visible on the screen of the VL.
# References


2. **Frova G**: Do videolaryngoscopes have a new role in the SIAARTI difficult airway management algorithm? *Minerva Anestesiol*; 2010, 76:637-640.


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*Train-of-four
†Post-tetanic count
‡Second twitch

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