THE AWAKE GLIDESCOPE INTUBATION: AN ADDITIONAL ALTERNATIVE TO THE DIFFICULT INTUBATION

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Abstract

Background: The incidence of difficult intubations has consistently remained between 8 and 9%. We found a novel approach to the difficult intubation using a Glidescope in the awake spontaneously breathing patient. Methods: In a difficult airway, the same approach for an awake fiberoptic intubation including excellent nerve blocks and sedation can be used with a Glidescope in the same fashion as a fiberoptic bronchoscope. Results: The skill level for the awake Glidescope appears to be less, making it a useful tool for emergency room physicians and critical care physicians when used for awake intubation. It is particularly useful for the patient who fails the airway exam and also has macroglossia. Conclusion:This case report confirms that while not applicable to every patient, the awake Glidescope intubation does add to the previous existing armamentarium in this clinically challenging situation.

Introduction

Examination of data from the ASA Committee on Professional Liability Closed Claims Project indicates that the incidence of severe anesthesia-related injuries (death, brain damage, etc.) is declining. Despite a reduction in the number of esophageal intubations, the incidence of difficult intubations consistently remains between 8 and 9%[1]. Although this number represents but a small number of closed claims under the headings of "death" and "severe brain damage," it remains alarmingly high for the practicing anesthesia provider. The literature is replete with different paradigms for airway evaluation: the meta-analysis by Shiga et al.[2] which included over 50,000 patients concluded that the clinical value of the most commonly performed components of the airway examination is limited. As such, creating an airway examination that is both highly sensitive and specific for the difficult intubation remains a clinical dilemma.

There are indeed multiple devices that have made the difficult airway less challenging. Yet, there is a lack of consensus as to which provides the most utility, at least in part attributable to a general lack of experience. Three cases are presented below to provide insight into the armamentarium that the anesthesia provider has when faced with a difficult intubation.

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Case Report 1

A 130-kg male (BMI=52) status-post meningioma resection presents for brain MRI for evaluation of seizures occurring on the second post-operative day. He "failed" his airway examination based on the inability to lie flat without airway obstruction, inability to visualize the uvula, a neck circumference of 50 centimeters, and a history of sleep apnea. Two previous intubation attempts were made that day with sedation that included dexmedetomidine and propofol. Both attempts were successful in eliminating patient anxiety, but caused excessive cranial motion due to partial airway obstruction. The second included a fiberoptic-guided awake intubation, but due to macroglossia, the patient became increasingly agitated with each effort at visualizing his airway.

The patient was allowed to rest for three hours, after which a second anesthesiology team was consulted to provide a general anesthetic. The patient was transported to an area near the MRI room that contained all necessary equipment needed to secure a difficult airway. A thorough discussion evaluating the need for an awake intubation occurred prior to initiation of securing the airway. It was emphasized to the patient that if at any time he experienced discomfort, the anesthesia care team would pause and augment the appropriate nerve blocks and/or sedation. As the patient had already experienced failed intubation attempts and was extremely anxious, the anesthesia care team only proceeded once the patient was in full agreement. The patient was instructed that although his comfort would be a priority, full amnesia could not be guaranteed.

The head of the bed was elevated to approximately 45 degrees and nasal cannula was applied. Despite the size of the patient, only 2 mg of midazolam was administered. The patient was asked to orally rinse viscous lidocaine and to swallow the solution. This was repeated 5 times until the patient reported numbness at the base of his tongue and pharynx. 10 mg of droperidol was then administered. There was no change in blood pressure or respiratory effort. As predicted, the patient developed a flat affect and became amenable to suggestion. A transtracheal block with 4cc of 4% lidocaine administered to the recurrent laryngeal nerve was performed without patient complaint. The internal branch of the superior laryngeal nerve was blocked with 5cc of 4 % lidocaine utilizing a hand held atomizer placed in the pyriform fossa. The tip of the atomizer was placed in the fossa without complaint due to the initial viscous lidocaine application. The remaining lidocaine was sprayed into the back of the pharynx. The patient reported that his throat was completely numb thereafter.

A Glidescope (Verathon Medical Europe, Ijsselstein, Netherlands) was gently applied in accordance with standard protocol and with expected manipulation. The vocal cords were visualized and the endotracheal tube was passed through them without any resistance. End-tidal CO_2 was confirmed with a bedside capnograph and the patient was transported to the MRI machine while spontaneously breathing and without attempting to remove the endotracheal tube. An anesthesia circuit was connected and the patient spontaneously breathed sevoflurane. Vecuronium was administered once the patient was asleep. The patient remained intubated for three hours after the procedure and extubation was performed without incident.

Case Report 2a-c

Three patients, whose airway examinations were similar to that of the first patient, presented for laparoscopic gastric banding. Sedation and airway nerve blocks were performed in similar fashion. A detailed explanation of the technique was given to all three patients. The same attending anesthesiologist participated in the care of all three patients. Awake fiberoptic-guided intubations were performed once sedation and airway blocks were judged to be satisfactory. In all three cases, macroglossia prevented adequate visualization of the airway. The bronchoscope was replaced with a Glidescope in all these cases and exposure, visualization, and intubation were carried out efficiently thereafter. Each patient had recollection of the intubation and stated that there was only minimal discomfort.

Case Report 3

A 170-kg patient who had lost 45 kg in 6 months secondary to an open gastric bypass presented for evaluation of a bile leak after a recent laparoscopic cholecystectomy at another institution. While the

patient was unable to describe the intubation for the cholecystectomy, the airway examination met our departmental criteria for an awake intubation. The patient was very apprehensive after a lengthy discussion concerning an awake intubation. Reassurance supplemented by sedation with midazolam (4 mg) allowed the anesthesia team to attempt an awake Glidescope intubation. The patient opposed the approach and grabbed the Glidescope from the anesthesiologist, complaining of severe discomfort. An awake fiberoptic-guided intubation attempt, while lengthy, was successful. While the patient did recall the discomfort of the Glidescope, there was no recollection of the fiberoptic intubation.

Discussion

The most commonly utilized components of the airway exam (Mallampati score, thyromental distance, neck circumference, sleep apnea history and mouth opening) were applied to each of the above patients. The presence of several positive-findings on airway examination has been shown to increase the sensitivity and specificity of the exam when compared to a single positive-finding[2]. The relative "ease" of the awake intubation in the above cases does not suggest that the procedure will proceed as well as those described. Furthermore, there is no implication that the examination that determined the need for the awake approach was accurate. These cases only underscore the need for better evaluation and techniques. The amount of adipose tissue surrounding the airway may be an indicator of difficult intubation. It is possible that the use of ultrasound[3], which is now popular in several clinical arenas, may be used to assess this adipose tissue. Ultrasound technology is readily available, cost effective, and may prove to refine the examination.

Above all, these cases are presented to demonstrate alternatives to the awake intubation without making a direct comparison to other awake techniques. While there are multiple studies that compare awake techniques[4], it is very challenging to design an adequate study protocol, as there is variability in each airway and operator. One could evaluate safety and comfort in the same patient by attempting only visualization of the vocal cords with different methods. However, the anesthesiologist must be the same for each attempt and performing one technique may make a subsequent attempt with a different attempt more challenging. There are several studies comparing different intubating devices[5,6]. Speed of intubation, airway trauma, and success rate are often cited when comparing devices. These categories are dependent on operator skill and therefore define the complexity of comparing devices. This circumstance highlights that the anesthesiologist may need to gain proficiency with each new device that appears in the marketplace.

The incidence of difficult intubation outside the operating room is complicated to assess, as emergency room physicians and critical care physicians have also gained airway management skills in centers where this education is incorporated into their respective training programs. Unfortunately, some patients of these physicians are unable to participate in the more extensive anesthesia airway assessment, and the Mallampati exam is not helpful in judging these difficult intubations[7]. Anesthesiologists are often consulted to assist or perform awake intubations in these scenarios.

The awake Glidescope technique is one that could be introduced into the emergency room physician or intensivist's training. It is presented here as a reasonable alternative to awake fiberoptic bronchoscopy or any other device, as it appears that less training and skill is involved in the actual intubation process. As the last case demonstrates though, the awake Glidescope is not the panacea for the difficult intubation. The success of any new airway device must incorporate excellent communication with the patient, sedation that does not compromise ventilation of the airway, and excellent nerve blocks for patient comfort and ease of instrumentation. We are unaware if the awake Glidescope technique has been reported in the literature as another reasonable approach to the difficult intubation. As evolving technology is targeted at the difficult intubation, it is reasonable to expect that the associated closed claims will diminish. Despite our thorough examinations, the unforeseen difficult intubation remains an obstacle to optimal patient care. Ongoing studies that are also targeted at a more precise airway evaluation with a high sensitivity and specificity will also diminish closed claims in this area.

References

1. Cheney FW, Posner KL, Lee LA, Caplan RA, Domino KB. Trends in Anesthesia-related Death and Brain Damage: A Closed Claims Analysis. *Anesthesiology*; 2006, 105:1081-86.
2. Shiga T, Wajima Z, Inoue T, Sakamoto A. Predicting difficult intubation in apparently normal patients: a meta-analysis of bedside screening test performance. *Anesthesiology*; 2005, 103:429-37.
3. Mong A, Johnson AM, Kramer SS, Coleman BG, Hedrick HL, Kreiger P, Flake A, Johnson M, Wilson RD, Adzick NS, Jaramillo D. Congentital high airway obstruction syndrome: MR/US findings, effects on management and outcome. *Pediatr Radiol*; 2008, 38:1171-9.
4. Xue FS, Liu HP, He N, Xu YC, Yang QY, Liao X, Xu XZ, Guo XL, Zhang YM. Spray - as - you go airway topical anesthesia in patients with a difficult airway: a randomized double-blind comparison of 2% and 4% lidocaine. *Anesth Analg*; 2009, 108:536-43.
5. Lange M, Frommer M, Redel A, Trautner H, Hampe J, Kranke P, Kehl F, Scholtz Lu. Comparison of the Glidescope and Airtraq optical laryngoscopes in patients undergoing direct microlaryngoscopy. *Anesthesia*; 2009, 64:323-8.
6. Pott LM, Murray WB. Review of video laryngoscopy and rigid fiberoptic laryngoscopy. *Curr Opin Anaesthesiol*; 2008, 21:750-8.
7. Bair AE, Caravelli R, Tyler K, Laurin EG. Feasability of the Preoperative Mallampati Airway Assessment in Emergency Department Patients. *J Emerg Med*; 2009 March 16 [Epub ahead of print].