

Airway Management in a Bleeding Adult Following Tonsillectomy: A Case Report

Manjit Singh Brar, CRNA, MS

A 37-year-old morbidly obese man with a history of obstructive sleep apnea underwent elective tonsillectomy. The patient was successfully intubated with an 8.0-mm regular cuffed endotracheal tube. A large video laryngoscope (GlideScope, Verathon Inc, Bothell, Washington) was used for intubation, as airway assessment indicated a potentially difficult airway. The surgery was uneventful, but active bleeding was noticed in the oropharynx after extubation. The patient was reintubated, again with the use of a GlideScope. The bleeding site was cauterized, and the patient was extubated after meeting the criteria for an awake extubation. He was discharged home the following day.

Eight days postoperatively, the patient returned to

the emergency center with spontaneous bleeding from the oropharynx. He was taken to the operating room and, based on the previous GlideScope use, an attempt was made to intubate the patient with a GlideScope. The attempt failed, as the GlideScope screen was blurred by the presence of blood in the oropharynx, even though the oropharynx was suctioned. Resuctioning and reinsertion of the GlideScope probe did not provide an adequate visual field. After 2 failed attempts, the use of the GlideScope was abandoned. Subsequently, the patient's trachea was successfully intubated with a size 4 Macintosh blade.

Keywords: Bleeding oropharynx, GlideScope, Macintosh blade.

Tracheal intubation of a bleeding airway is a unique situation that represents a major challenge to even the most seasoned anesthetists. Today, in an era of innovative technology, anesthesia practice is enriched by multiple airway management modalities, such as the GlideScope (Verathon Inc, Bothell, Washington). These modalities, on the most part, have made it easier to manage difficult airways. However, like any other technology, these devices are not foolproof, and they certainly are not fit for every situation. The key to the management of a difficult airway continues to be the thorough assessment of the airway, available alternative airway devices and plans, and the presence of another anesthesia expert to assist in case of a failed attempt to secure the airway.¹

For a patient with a bleeding oropharynx, one should follow the difficult airway guidelines developed by the American Society of Anesthesiologists (ASA).¹ However, these guidelines or other available new or old modalities do not specifically address the management of a bleeding airway.¹ Furthermore, the risk of aspiration from bleeding is an added challenge that makes it very difficult to secure the airway for surgery.² In addition, hemodynamic instability and hypoxia as a result of bleeding and inability to secure the airway can be further compromised with a prolonged or failed intubation.²

Postoperative hemorrhage is the most serious complication of tonsillectomy.³ The common time for postoperative bleeding varies from the first 6 hours to 7 to 8 days postoperatively.³ However, bleeding has been reported up to 6 months after tonsillectomy.⁴ Most of the bleeding

originates from the tonsillar fossa and often requires surgical exploration and hemostasis.³ Bleeding is usually sudden and occurs most often when the "scab" falls off the tonsil area 7 to 10 days after the surgery.⁴ These patients are considered as having a full stomach because constant bleeding results in patients swallowing large amounts of blood. Severe blood loss and a compromised airway are the 2 main reasons for morbidity and mortality of these patients.⁴

Case Summary

The patient was a 37-year-old morbidly obese man who weighed 118 kg and had a height of 180 cm. His body mass index (BMI) was 36.4 kg/m². He had no known drug allergies. His past medical history included untreated hypertension, obstructive sleep apnea, and morbid obesity. He did not wish to use continuous positive airway pressure (CPAP) at night, as recommended by his primary care physician. He had elected the option to undergo tonsillectomy as a potential treatment of sleep apnea. The patient's past surgical history included septoplasty with no known anesthetic complications. He was not taking any prescription or over-the-counter drugs.

For his elective tonsillectomy, the patient was intubated with an 8.0-mm regular cuffed endotracheal tube. A large GlideScope was used for intubation, as airway assessment had indicated a potentially difficult airway. The surgery was uneventful, but active bleeding was noticed in the oropharynx after extubation. The patient was reintubated, again with the use of a GlideScope. The bleeding site was cauterized, and the patient was extubated after

meeting the criteria for an awake extubation. He was discharged home the following day.

Eight days postoperatively, the patient returned to the emergency center with active bleeding from the oropharynx. He reported that the bleeding started spontaneously at approximately 6 PM at home. He was seen at about 10 PM in the preoperative holding area. He was scheduled for an emergency exploration of the bleeding oropharynx. During anesthetic assessment, the patient was seen sitting on the stretcher holding a plastic bucket in his hands constantly expectorating blood in the bucket. There was an estimated 200 mL of frank blood and blood clots present in the bucket.

A review of his laboratory data revealed a hemoglobin of 15.5 g/dL with a hematocrit of 44.8% and a platelet count of 293,000/mL. Blood chemistry values were as follows: sodium, 139 mmol/L; potassium, 4.0 mmol/L; chloride, 99 mmol/L; bicarbonate, 30 mmol/L; serum urea nitrogen, 14 mg/dL; creatinine, 1.0 mg/dL; and glucose, 95 mg/dL. The patient had an 18-gauge intravenous catheter in place, with about 300 mL of 0.9% normal saline infused from the emergency center. The patient's preoperative vital signs were as follows: blood pressure, 156/100 mm Hg; pulse, 98/min; respirations, 22/min; and hemoglobin saturation with oxygen was 98% on room air. He was assessed to be a Mallampati class 2 because of excessive neck tissue and a large tongue obstructing the view of the tonsil pillars. The thyromental distance was adequate.

A GlideScope with a large blade was made available in the operating room, and a Macintosh blade size 4 was also available on the anesthetic cart as a backup blade. The diagnosis was post-tonsillectomy hemorrhage, with a plan for emergency surgical exploration of the oropharynx and cessation of bleeding. The anesthetic plan was discussed among the anesthesiologist, Certified Registered Nurse Anesthetist, student nurse anesthetist, and the ear, nose, and throat (ENT) surgeon. The anesthetic plan was to induce general anesthesia with a rapid-sequence induction and intubation via a GlideScope. For tracheal intubation, it was decided to use a GlideScope because it was used successfully in his 2 previous intubations with tonsillectomy surgery. The patient was informed of the anesthetic plan, and he accepted it.

He was taken to the operating room, and the patient transferred himself over to the operating room table. Standard monitors were applied and the patient was purposefully preoxygenated for about 8 minutes, with frequent suctioning of the oropharynx. The patient was given 2 mg of midazolam and 200 µg of fentanyl by the intravenous push method. Cricoid pressure was applied; 200 mg of propofol was administered, followed by 140 mg of succinylcholine. After fasciculations were witnessed, the oropharynx was suctioned and an attempt was made to view the vocal cords with the GlideScope.

The GlideScope screen appeared blurry, with no view of the oropharynx or vocal cords. The GlideScope probe was removed and, after resuctioning of the oropharynx, an attempt was made again to view the oropharynx with the GlideScope. Again, the screen of the GlideScope was blurry and showed no view of the oropharynx or vocal cords. At this point, use of the GlideScope was abandoned and an attempt was made to intubate the trachea with a Macintosh blade, size 4. This attempt was successful. The placement of the regular endotracheal tube, size 8.0 mm, was confirmed with auscultation of the lungs for bilateral air entry and positive end-tidal carbon dioxide. The cricoid pressure was then released. The oxygen saturation was restored quickly to 100%, from as low as 60%, for about 30 seconds during apnea or failed intubation.

After the proper positioning of the patient's head, the surgical team proceeded with exploration of the oropharynx. A single bleeding spot was identified and cauterized. Once the oropharynx appeared to be dry, the trachea and the stomach were suctioned for an estimated 100 mL of blood. After hemostasis was confirmed, the patient was extubated by following the criteria of an awake-patient extubation. The patient was taken to the postanesthesia care unit, with oxygen administered through a simple mask. He was later admitted to the intensive care unit overnight for airway monitoring. He was discharged home the following day.

Discussion

This case report emphasizes the need to be prepared for the worst and the need to have a backup plan in case of difficulty with intubation. Furthermore, one cannot solely depend on the alternative modalities. A GlideScope is considered a modern innovation in airway management, but it is not a foolproof alternative to the traditional laryngoscopy techniques, as evidenced by this situation. Blood in the oropharynx is a unique situation that presents a challenge even for seasoned anesthesia practitioners. Blood-covered oropharynx blocks the light source of a GlideScope. A fiberoptic scope cannot be used for the same reason. The laryngeal mask airway and the other nonsurgical emergency ventilation options, such as transtracheal jet ventilation, also carry the risk of aspiration and an insecure airway.⁴

In case all the mechanisms or alternatives fail, the ASA guidelines call for the establishment of an emergency surgical airway.¹ This was an option in this case, as the ENT surgeon was in the room and was actually helping suction the oropharynx and monitor the situation. An emergency cricothyrotomy is another available option.⁴ Waking up the patient could have also been considered in case an emergency surgical airway option was not readily available.

Tonsillectomy for treatment of obstructive sleep apnea in an adult population has not been cited well in the

English literature.⁴ As a result, there are very limited data available describing the incidence of post-tonsillectomy bleeding in adult patients. In one age-specific retrospective study, adult men 15 years and older were found to have higher incidence of post-tonsillectomy hemorrhage requiring surgical intervention as compared to a pediatric group younger than 15 years.⁵ No reasons were cited for this difference. One can only speculate that the more frequent incidence of post-tonsillectomy bleeding in adults is a result of the larger size of the tonsils (hence, more established blood supply) and their potential use of over-the-counter nonsteroidal anti-inflammatory drugs (NSAIDs). A correlation between obstructive sleep apnea and post-tonsillectomy bleeding also could not be established in the literature.

Conclusion

Anesthesia practitioners are considered experts in airway management. However, there are unique airway situations that can overwhelm even the most experienced anesthetist and potentially compromise a patient's airway. Blood in the oropharynx is an example of such a situation that can compromise the airway and carries an overwhelming potential for aspiration. Airway management devices such as a GlideScope appear to have simplified the management of difficult airways. However, a total reliance on these devices can be potentially catastrophic, as these devices are not foolproof. Difficult situations such

as a bleeding airway still require a thorough assessment of the airway, careful planning to ensure that alternative devices and plans are available, asking for additional expert support, and the availability of a backup surgeon for establishing an emergency surgical airway.

REFERENCES

1. Practice guidelines for management of the difficult airway: an updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. *Anesthesiology*. 2003; 98(5):1269-1277.
2. Donlon JV. Anesthesia for eye, ear, nose, and throat surgery. In: Miller RD, ed. *Anesthesia*. Philadelphia, PA: Churchill Livingstone; 2000: 2173-2198.
3. Ferrari LR, Gotta AW. Anesthesia for otolaryngologic surgery. In: Barash PG, Cullen BF, Stoelting RK, eds. *Clinical Anesthesia*. Philadelphia, PA: Lippincott Williams & Wilkins; 2006:997-1012.
4. Cohen D, Dor M. Morbidity and mortality of post-tonsillectomy bleeding: analysis of cases. *J Laryngol Otol*. 2008;122(1):88-92.
5. Windfuhr JP, Chen YS. Incidence of post-tonsillectomy hemorrhage in children and adults: a study of 4,848 patients. *Ear Nose Throat J*. 2002;81(9):626-632.

AUTHORS

Manjit Singh Brar, CRNA, MS, is a staff nurse anesthetist at Port Huron Hospital, Michigan. At the time this paper was written, he was a student at Oakland University Beaumont Graduate Program of Nurse Anesthesia, Royal Oak, Michigan. Email: msbrar2@oakland.edu.

ACKNOWLEDGMENT

The author recognizes Anne Hranchook, CRNA, MS, for her guidance and encouragement to write this paper. Also, special thanks to the didactic and clinical anesthesia instructors at William Beaumont Hospital, Royal Oak, Michigan, and its affiliated CRNA teaching sites.