Report of 2 Cases of Oropharyngeal Injury With the Use of Video Laryngoscopy Techniques

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Although the trend toward video laryngoscopy and away from direct laryngoscopy might be associated with a greater likelihood of successful intubation, appropriate training is necessary to prevent injuries. This report describes 2 instances of operator error that resulted in penetrating injury to the soft palate and presents a review of the literature.

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With the introduction of newer technology, there has been a movement away from direct laryngoscopy and toward video laryngoscopy (VL). Anesthesiologists currently have an arsenal of VL options, with the GlideScope (Verathon, Bothell, WA) among the most popular. The GlideScope improves the success of intubation in difficult airway management; however, complications and injuries have resulted from its use. Therefore, appropriate training in VL technique is essential. This report describes 2 routine cases during which VL led to unexpected complications and suggests improvements to the process to ensure safer use of VL.

Report of Cases

CASE 1

A 30-year-old woman who was morbidly obese and had fallen was scheduled for open reduction and internal fixation of the left humerus. Her thyromental distance and oral opening were greater than 3 finger breadths, she had a thick neck, and she was in Mallampati Class 3. The anesthesiology team planned a general endotracheal anesthetic with direct laryngoscopy. A GlideScope was available in the operating room as backup in case a difficult airway was encountered because of the patient's size.

In the operating room, the patient was appropriately positioned in the sniffing position, with blankets used for ramping to align her airway. A health care professional who was in the operating room to practice airway management asked that VL be used as the initial mode of intubation because he wanted to have an opportunity to practice with the device. The attending anesthesiologist carefully explained how to use the GlideScope and safety precautions to prevent injuries, such as soft tissue lacerations.

The patient was preoxygenated and induced with fentanyl, lidocaine, and propofol. After determining the patient could be mask ventilated without difficulty, intravenous rocuronium was given. Once adequate relaxation was achieved, the health care professional carefully placed the GlideScope Macintosh 3 blade and watched closely as it entered the patient's pharynx. Using the VL screen, he visualized the glottic

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opening and vocal cords. The endotracheal tube (ETT) with a rigid stylet in place was passed without difficulty through the vocal cords and the stylet was removed. As the blade was removed from the patient's mouth, the anesthesiologist noticed a ring of tissue around the ETT. It was discovered that the ETT had passed through the tissue of the soft palate before being passed through the glottis. This occurred outside the view of the GlideScope camera. The health care professional, who was watching the video screen rather than looking directly into the patient's mouth as the ETT was inserted into the pharynx, was unaware of the injury. Otherwise, the ETT was placed properly through the vocal cords and confirmed with positive end-tidal CO_2 and bilateral equal breath sounds on auscultation. The decision was made to leave the ETT in place owing to the potential for bleeding and further injury by removing the ETT. The oral surgery service was consulted immediately for evaluation and repair. The orthopedic surgery proceeded uneventfully; and after it was completed, the oral and maxillofacial surgeon repaired the laceration (Figs 1-5).

CASE 2

A 52-year-old man was scheduled for a left rotator cuff repair using general endotracheal anesthesia with direct laryngoscopy. After appropriate positioning in the sniffing position, the patient was preoxygenated and induced with fentanyl, lidocaine, and propofol, and rocuronium was given after it was determined that the patient could be mask ventilated without difficulty. Once adequate relaxation was achieved, the anesthesiology resident attempted direct laryngoscopy with a Miller 2 blade and a Macintosh blade 4, but was unable to visualize the glottic opening with either blade. At this point, the patient was mask ventilated and VL using a GlideScope was attempted. After the blade was inserted into the patient's oropharynx, the airway became bloody. The patient's oral cavity was immediately suctioned and the glottic opening was visualized; however, the ETT could not be passed through the glottic opening because of a poor angle. The attending anesthesiologist took over the airway, but was unable to pass the ETT because it seemed to be "stuck."

The ETT was removed, the patient was re-masked, and assistance was requested. At the subsequent VL attempt, airway trauma and serious bleeding were noted. The glottic opening was visualized after suctioning of the oral cavity, but reintubation was unsuccessful. The patient was intubated at the final attempt, but the ETT had been passed directly through the soft palate (Fig 6).

The oral and maxillofacial surgery service immediately repaired the laceration of the soft palate, after which orthopedic surgery performed the originally scheduled procedure. The patient was extubated at the end of the case, admitted overnight for observation, and discharged home the following morning.

Discussion

There are many important anatomic structures bypassed when performing endotracheal intubation. Anesthesia providers understand the importance of atraumatically securing the airway while avoiding injury to the lips, central incisors, arytenoids, and oropharyngeal mucosa.[1-4] The anatomy of the aerodigestive tract is complicated and particular anatomic structures will be discussed that have

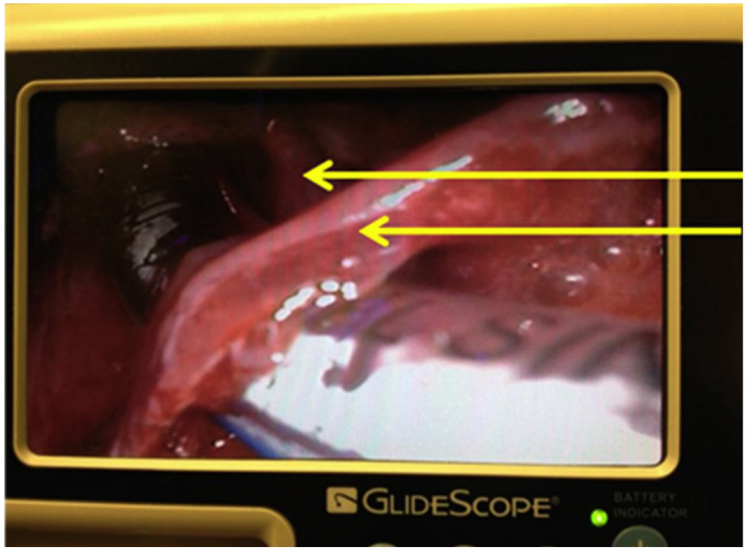

FIGURE 1. GlideScope video laryngoscopic view of ETT perforating the palatoglossal arch and soft palate. ETT, endotracheal tube.

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