

Awake Glidescope[®] intubation in patients with severe arytenoid swelling after laryngeal surgery with radiation therapy

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General anesthesia in patients who have previously undergone supracricoid partial laryngectomy (SCPL) and radiation therapy for laryngeal cancer is not common but a challenging task for anesthesiologists because of the distortion of the airway anatomy with stiff neck.

A 42-year-old (171 cm, 73 kg) man was scheduled for insertion of a percutaneous endoscopic gastrostomy (PEG) feeding tube under general anesthesia. One month before the referral, the patient had undergone SCPL and a bilateral neck dissection with tracheostomy and then adjuvant radiation therapy for laryngeal cancer. There was no problem with facial mask ventilation and intubation at that time. He was fed through a nasogastric tube. PEG insertion is generally performed under local anesthesia with sedative agents such as midazolam. However, he had a history of airway obstruction after intravenous administration of midazolam. Therefore, the gastroenterologists consulted us because his preoperative airway evaluation was expected to indicate difficult intubation (Fig. 1). We discussed a "can't intubate, can't ventilate (CICV)" state including mortality risks, and an awake intubation with the patient in details.

However, as for a fiberoptic bronchoscopy (FOB), the patient refused. In case of critical situation, various kinds of laryngeal mask airway (LMA) and Glidescope[®] (Verathon Inc., Bothell, WA, USA) were prepared, and there was no choice to leave an awake procedure as our last option.

Sufficient preoxygenation (100% oxygen at 6 L/min over 5 minutes) was applied through a facial mask. Thiopental sodium 350 mg and succinylcholine 80 mg were administered for anesthetic induction. After the drugs, mask ventilation could not be

effective. At that moment, immediate endotracheal intubation by direct laryngoscope was attempted with an armored tube (ID: 8.0 mm), and then a smaller tube (ID: 7.0 mm), however, these actions failed. The vocal cords could not be viewed because of swollen arytenoids with his stiff neck. We soon determined that he was in a CICV state. So we used supraglottic airway (LMA I-gel[®], No 4) temporarily with little success. The patient regained consciousness and started breathing fortunately. His oxygen saturation (SpO₂) by pulse oximetry remained above 97%. After

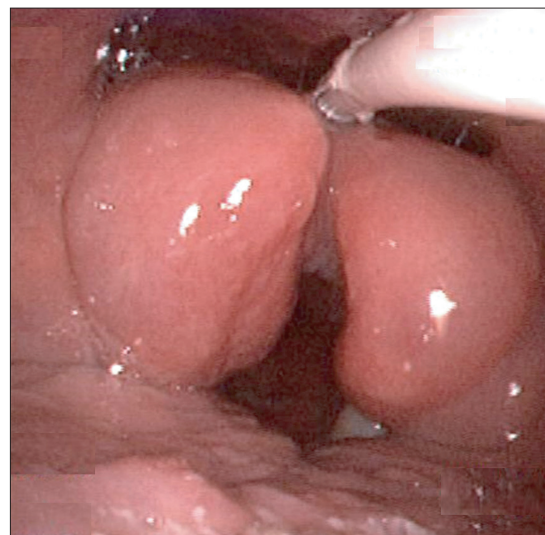


Fig. 1. The perioperative laryngoscopic view shows severe swelling of both arytenoids. A feeding nasogastric tube shows a white catheter.

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he was a full wake-up, we explained to the patient his current state and the necessity of performing an awake intubation, and performed successfully with an armored endotracheal tube (ID: 6.5 mm) using GlideScope[®] after topical lidocaine spray.

The surgery was uneventful and performed using minimally invasive techniques. After he had full recovery of consciousness and muscle tone, endotracheal tube was removed successfully in the post-anesthetic care unit, and was transferred to the general ward without any problems. There were no postoperative complications noted, and his conditions were gradually improved.

A multi-disciplinary approach is widely accepted for laryngeal cancer, however, one of the greatest problems after treatment is a compromised airway [1]. Neck extension was also severely limited after those therapies. Those had made his arytenoid cartilage more edematous, and the narrowed airway led to increased flow velocity, thereby causing the airway mucosa to dry and swell, may have further aggravated these processes, resulting in the CICV state. Concerned about his arytenoid swelling, there was the possibility of airway loss by sedation and paralysis. An awake intubation is presumably the most reliable method; however, we could not approach first because of patient's refusal. Using FOB seems reasonable, but also has had drawbacks, not only should be difficult for performing, but has the risk of trauma and bleeding to the swollen arythenoid, might cause loss of the airway. Owing to a floppy epiglottis or an anatomically deviated larynx, the endotracheal tube guided by FOB could not be moved onward [2]. Arytenoids were known to frequently inhibit advancement of the endotracheal tube over the FOB into

the trachea during awake procedure [3], then hard and daunting incidents could be happened. The Glidescope[®] considered an added option in such situations. Administering a nerve block for FOB may be dangerous in this case. Due to either simultaneous blocking of the carotid sinus nerve, which gave rise to arrhythmias, or to intraarterial injection and hypopharyngeal swelling with bleeding it obscured the vocal cords and made insertion procedure more difficult [4]. In fact, the LMA is not recommended because of the possibility of a compromised distal airway. The safest procedure to maintain the airway is to perform a tracheostomy before the surgery; however, the risks and benefits of a tracheostomy should be carefully weighed beforehand.

The Glidescope[®] offers accurate visualization of the glottis with clear laryngeal exposure compared to a direct laryngoscope due to higher magnification, reliable illumination and relatively fast and simple to perform. It is reported its clinical application to the awake intubation has been on the increase [5]. The result was gratifying in this case. Therefore, to prevent catastrophic results in this case, clinicians need to be aware of the possibility of difficult airway and its algorithm.

In conclusion, for optimal anesthetic management of laryngeal cancer patients preoperative evaluations should be performed thoroughly. An awake intubation using the GlideScope[®] was successful on this wise. A close collaboration among the surgeon, anesthesiologist and patient during intubation should be mandatory. An awake intubation can be a challenging, but we believe we can make it safe as much as we are prepared to.

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