Korean J Anesthesiol 2023;76(6):643-644

Corrosive poisoning and its implications on pediatric airways

Pharyngeal webs are a rare anomaly that occur after corrosive ingestion due to liquefaction necrosis (bases) or coagulation necrosis (acids). The mucosal lining heals by fibrosis, causing upper airway stenosis, synechiae, band formation, and esophageal stricture. In India, corrosive poisoning poses a large burden on the healthcare system, accounting for approximately 2% of the total cases of poisoning, and is associated with high morbidity and mortality, estimated at 50% and 13%, respectively [1].

For these patients, securing the airway is an anesthetic challenge owing to the distorted anatomy of the upper airway. Drooling and an inability to swallow indicate severe posterior pharyngeal or upper esophageal injury. The presence of hoarseness, stridor, nasal flaring, or rib retraction upon inhalation suggest airway involvement [2]. Multiple endoscopic or open procedures may be required to treat complications like pharyngeal and laryngeal webs, synichae and esophageal stricture. Airway management is thus both complicated and of paramount importance. Here, we discuss the challenges faced and measures taken to secure the airway in a pediatric patient with post-corrosive esophageal stricture posted for feeding jejunostomy.

A 14-year-old female with a history of corrosive poisoning in May 2022 presented with an esophageal stricture and was posted for feeding jejunostomy. She had previously undergone upper gastrointestinal endoscopy and esophageal dilatation six times. Preoperative airway examination revealed mouth opening of three fingers, a Mallampati score of II (Fig. 1A), stable vitals, and all routine investigations within normal limits. Written informed consent was obtained from the parents. Anticipating a difficult airway, the patient was attached to operation theatre standard monitors, with a fiberoptic flexible bronchoscope video scope (Storz®, Karl Storz Endoskope, Karl Storz Endoscopy India pvt Ltd., India) at the ready, and the cricothyroid membrane was marked using the laryngeal handshake technique. Pre-oxygenation was initiated with 100% oxygen using a closed circuit and intravenous (IV) fentanyl 2 μg/kg and propofol 2 mg/kg were administered for induction. A size 2.5 i-gel® supraglottic airway device (Intersurgical complete respiratory system, UK) was introduced, which had a significant leak. A size 3 i-gel® supraglottic airway device (Intersurgical complete respiratory system, UK) was then introduced, which also had a leak. As mask ventilation was possible, tracheal intubation using succinylcholine 1.5 mg/kg was conducted. Direct laryngoscopy revealed a distorted airway, with multiple visible webs and openings. The epiglottic tip was identified with great difficulty as it was embedded in the scar tissue. Because we were unsure of the location of the trachea, a fiberoptic bronchoscope was used for identification (Fig. 1B). The trachea was confirmed by direct visualization of the tracheal rings and carina, and the endotracheal tube was railroaded over the flexible bronchoscope (Fig. 1C). The position of the tube was confirmed by bronchoscopy and end-tidal CO_2. IV dexamethasone (8 mg), hydrocortisone (100 mg), and vecuronium (0.1 mg/kg) were administered after the effect of succinylcholine subsided. Anesthesia was maintained with 50% oxygen and 2 L total flow with sevoflurane at 1 minimum alveolar concentration. Once the surgical procedure was completed, the ENT team was called for endoscopy and ablation of the synechiae. The neuromuscular blocking agents were reversed with 100% oxygen, IV neostigmine (0.04 mg/kg body weight), and IV glycopyrrolate (0.01 mg/kg body weight). Once fully awake, the patient was extubated and transferred to the post-anesthesia care unit for observation.

Although the airway examination was normal in the preoperative evaluation, a difficult airway should be anticipated in patients with a history of corrosive poisoning and appropriate arrangements should be made. The use of a laryngeal mask airway is limited to patients with normal upper airway anatomy and is thus seldom used in those with distorted airway conditions. The hallmark of management in these cases includes preservation of spontaneous ventilation until confidence in the airway is reached following laryngoscopy. Intubation must be performed under visual guidance to avoid passage into a false track or incorrect placement of endotracheal tube [3].

Airway mismanagement remains an important cause of mortality and morbidity in anesthetic practice. Conventional rigid direct laryngoscopy aids tracheal intubation in 98.1% of the cases [4]. Thus, alternative equipment and techniques must be readily available for the re-

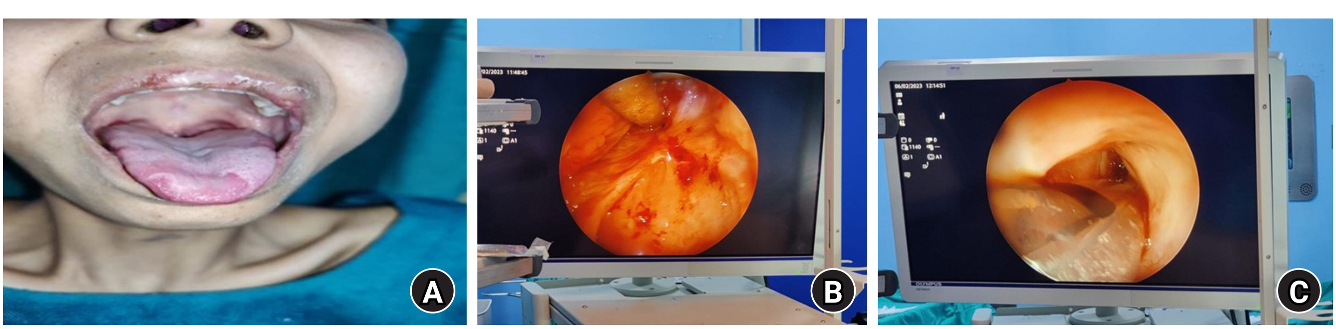

Fig. 1. (A) Modified Mallampati score of II. (B) Pharyngeal web seen on fiberoptic bronchoscopy. (C) Endotracheal tube passing through the vocal cords.

maining 1.9% of cases. These patients can also have tracheal stenosis; thus, a preoperative neck radiograph (AP, lateral view) or computed tomography is advised, and smaller endotracheal tubes and a backup for front-of-neck access should be arranged.

We conclude that every case of post-corrosive poisoning, acute or chronic, that requires tracheal intubation should be defined as a difficult airway case and appropriate arrangements according to available guidelines must be made to prevent airway mishaps [5].

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Received: June 8, 2023; Accepted: June 19, 2023

Funding: None.

Conflicts of Interest: No potential conflict of interest relevant to this article was reported.

Author Contributions: Yashwant Singh Payal (Conceptualization; Supervision); Sachin Sogal P (Formal analysis; Project administration); Pooja CS (Data curation; Resources; Writing – original draft)

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Korean J Anesthesiol 2023;76(6):643-644
https://doi.org/10.4097/kja.23445

The novel diagonal suprascapular canal block for shoulder surgery analgesia: a comprehensive technical report

A combination of the sub-omohyoid suprascapular nerve (SSN) block and subscapularis plane (SSP) block can be administered to provide a "shoulder block." This innovative block is performed through an anterior approach and blocks the lower and upper subscapular nerves and axillary nerve at a proximal level [1].

Despite the evident benefits of this technique for shoulder surgery, the articular branch of the lateral pectoral nerve, supraclavicular branches of the cervical plexus, and musculocutaneous nerve are not affected The main advantage of this combined shoulder block compared with other techniques, such as the interscalene block, is the reduction in the motor and sensory block of the upper limbs and minimal phrenic paralysis [1,2].

Due to the more selective and safer profile of this shoulder block compared with other techniques, highly concentrated (low-volume) local anesthetics may be given in single-shot administrations to prolong the duration of the blockade, contributing to a painless first postoperative night [3]. The anterior approach of these blocks is paramount to minimizing patient discomfort and simplifying the procedure, which is particularly relevant in the trauma setting. However, most studies on the sub-omohyoid SSN block have shown a lack of brachial plexus or phrenic nerve sparing in several patients [4].

The prevertebral fascia only separates the SSN from the brachial plexus at the lateral sub-omohyoid plane. Therefore, even though the needle does not penetrate the fascia, in most cases the local anesthetic may spread to parts of the plexus. In fact, a study by Siegenthaler et al. [4] demonstrated that the median distance from the SSN to the brachial plexus was only 9 mm (range 4–18 mm) among 60 healthy volunteers. In a cadaveric study using 5 ml of dye, mild staining of the phrenic nerve was found in two of the nine dissections [5].

Due to the risk of phrenic nerve involvement, the sub-omohyoid SSN block may not be recommended for high-risk pulmonary patients. Additionally, this block is associated with a risk of significant upper limb sensory and motor block. Indeed, the target site for the sub-omohyoid SSN block is the region where the SSN exits out of the prevertebral compartment after coursing beneath the inferior belly of the omohyoid muscle (OHM) and branching off from the superior trunk.

The novel diagonal suprascapular canal (DiSC) block has been proposed to diminish these risks associated to sub-omohyoid SSN block. For the DiSC block, an anterior approach is used (in the supine position) away from the prevertebral compartment. In contrast to the sub-omohyoid SSN block, the DiSC block is performed along the suprascapular canal (SSC) from a superior incision point that accompanies the track of the SSN diagonally between the suprascapular and the spinoglenoid notches. In our approach for the "shoulder block", the DiSC block is combined with an SSP block.