Airway management in a patient with corrosive poisoning: New tools aid an old problem

With morbidity and mortality rates estimated at 50% and 13%, respectively, corrosive poisoning presents a large burden on healthcare.[1,2] Airway management in these patients is complicated, owing to the inflammation just after the ingestion, and in the late phase when sequelae like fibrosis and strictures distort the anatomy.[1] Unfortunately, these patients require multiple therapeutic procedures both endoscopic and open surgical to treat immediate complications such as perforations, sequelae such as strictures and to ensure enteral nutrition. While large volumes of data and guidelines are available for medical and surgical management of corrosive poisoning, airway management, which poses a complex challenge, is rarely discussed.

A 27-year-old woman presented for a revision coloplasty, 4 years after accidental corrosive consumption. She had previously undergone two surgeries just after her

accident for the same, with an uneventful course. On examination, the face, nose and oral cavity were free from injuries and deformities, but neck extension was restricted to 100°. The trachea was deviated to the left on clinical examination and neck radiogram [Figure 1]. A preoperative flexible nasal endoscopy showed a bulky epiglottis with no visible vocal cords. Point of-care ultrasonography (POCUS) with a linear probe in the transverse view determined the subglottic diameter at only 61 mm, which corresponded with an endotracheal tube size of 4.5 mm (outer diameter = 60 mm) [Figure 1].

Anticipating an easy mask ventilation albeit difficult intubation, the anaesthesia plan, based on the standard international airway guidelines, was to do a check laryngoscopy with a video laryngoscope under spontaneous respiration, followed by endotracheal intubation. Oxygen was administered at 15 L/min, using nasal cannulae from pre-oxygenation until a definitive airway could be established. Anaesthesia was induced with intravenous propofol 80 mg. Oxygen with 2% sevoflurane at 2 L/min was given through a closed circuit. Check laryngoscopy with C-Mac blade 3, video laryngoscope revealed a bulky overhanging epiglottis but no cords. On external, laryngeal manipulation, Cormack–Lehane (CL) grade II-b was achieved [Figure 2]. Intravenous suxamethonium 80 mg was then given. After the twitches subsided, a 4.5-mm uncuffed Portex endotracheal tube was passed after laryngoscopy. The intubation was atraumatic and the tube was a snug fit, indicating the correct size selection. The patient was ventilated using tidal volumes of 6 mL kg body weight and respiratory rate of 20/min to compensate for the potential high airway resistance due to the use of a smaller tube. Standard American Society of Anesthesiologists monitoring was used during surgery. The patient had an uneventful peri-operative course and successful extubation.

Al-Mazrou *et al*. found that magnetic resonance imaging (MRI)-guided measurement of airway diameter at the level of cricoid is a better predictor than using the traditional 'best fit' method.[3] In our resource-limited setting, POCUS was chosen as a low-cost, fast, radiation free and cheap alternative to MRI or computed tomography. Apnoeic oxygenation using nasal cannulae finds support in a review by Oliveira *et al*., where apnoeic oxygenation was found to increase perioperative saturation, decrease hypoxaemia and increase first-pass intubation rates.[4] Our choice of video laryngoscope rather than fibre-optic also finds support in a study by Yumul *et al*., who found faster cord visualisation and intubation time, and in a review by Karalapillai *et al*., where an improvement was described in the CL grade and higher first-pass intubation rates on using video laryngoscopes.[5,6]

By the combined use of pre-operative flexible nasal endoscopy and POCUS, to plan the airway management, and video laryngoscopy along with apnoeic oxygenation, to carry out the intubation, we were able to tackle this challenging airway, without exposing the patient to hypoxia and trauma due to multiple intubation attempts.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for

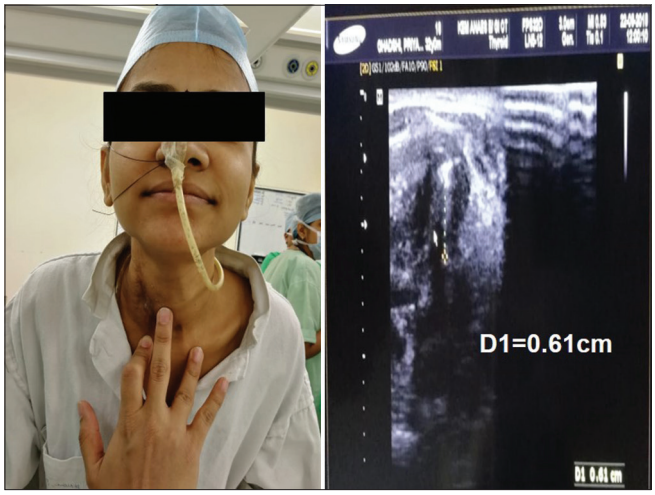

Figure 1: Pre-operative evaluation: (left to right) Clinical deviation of trachea to the right with restricted neck extension. POCUS – maximum subglottic diameter of 0.61 cm

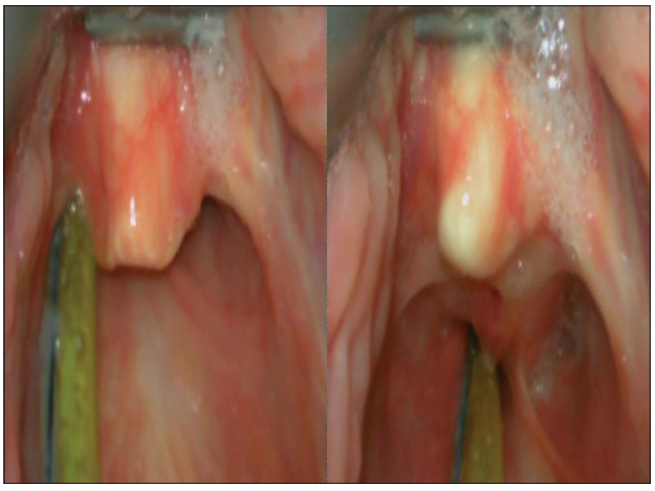

Figure 2: Intra-operative: (left to right) Laryngoscopic view with C-Mac blade 3 before and after external laryngeal manipulation

his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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