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## Case report: Airway management in post corrosive poisoning

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### Abstract

Corrosive substance ingestion in the acute phase may result in laryngeal injury, endotracheal or bronchial necrosis with mediastinitis, esophagus perforation. Most common late complications are fibrosis and strictures. Pharyngeal web is a rare anomaly which can be seen congenitally or after corrosive ingestion characterized by mucosal bands extending from the posterior pharyngeal wall anteriorly to the glottis. Challenges in anaesthetic management includes securing difficult airway due to distorted upper airway anatomy. Here, we report a case of pharyngeal web where we safely secured airway without injury to the webs with the use of video laryngoscope.

**Keywords:** Post corrosive complications, pharyngeal web, video laryngoscope

### Introduction

Pooled prevalence of corrosive poisoning in the whole population of India was found to be around 2% of the total cases of poisoning [1]. Ingestion of corrosive solutions may cause severe injury to aerodigestive tract and morbidity and mortality rates estimated at 50% and 13% respectively. 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 stricture distort the anatomy [2]. Pharyngeal web is a rare anomaly which can be seen congenitally or after corrosive ingestion characterized by mucosal bands extending from the posterior pharyngeal wall anteriorly to the glottis. Challenges in anaesthetic management include difficult airway, ETT manipulation, along with vigilant monitoring.

### Case history

A 18 yr old male patient (wt 48 kg) presented for colonic transposition 8 months after suicidal corrosive poisoning. He had undergone feeding jejunostomy just after corrosive poisoning ingestion in view of oesophageal injury. In preanaesthetic clinic- Patient had no visible facial injuries, no comorbidities or history of addiction, vitals within normal limits. Airway assessment showed no visible deformities and Mallampati score 4. Otorhinolaryngologist's opinion in view of distorted airway due to post corrosive poisoning was asked. In fiberoptic laryngoscopic assessment by otorhinolaryngologist, multiple web like structures were seen in oropharynx and multiple mucosal bands found between epiglottis and posterior pharyngeal wall. Barium swallow study showed inhalation of barium in laryngo-pharynx and trachea, irregularity and luminal narrowing in oro-hypopharynx, no barium pass into thoracic esophagus. Anticipating a difficult airway though easy mask ventilation, anaesthesia was planned according to standard guideline of DAS. Rapid sequence intubation was planned. Difficult airway cart was kept ready. Preoxygenation was started with 100% oxygen and patient premedicated with Inj. glycopyrrolate 0.2 mg i.v., Inj. Fentanyl 2 µg/kg. Induction done with Inj. Propofol 2mg/kg i.v., Inj. succinyl choline 2mg/kg and 2% sevoflurane. Under Video laryngoscopy (Infinium) using 4 no. MAC blade, grossly distorted airway could be seen, multiple webs and two openings were visible- One upper opening was shifted towards the left and the lower one slightly towards right. Epiglottic tip could be identified with great difficulty, as it was embedded in the scar tissue. After external laryngeal manipulation, vocal cords localised at 3 cm in depth inside left opening. Due to variation in this opening and glottic opening, exact ETT size could not be assessed so to prevent repeated attempts, Endotracheal tube was guided with bougie using rail-road technique and finally airway secured with oral cuffed endotracheal tube # 7.5mm

ID and fixed at 24 cm after checking bilateral air entry equal and present. The intubation was atraumatic and uneventful and tube size was adequate. The patient was ventilated using tidal volumes of 8ml/kg body weight and respiratory rate 14/min. Standard ASA monitoring was used intra-operatively. Patient was given Inj. Dexamethasone 8 mg i.v and Inj. Hydrocortisone 100mg i.v. Inj. Atracurium 0.5mg/kg i.v given after effect of succinylcholine subsided. Anaesthesia was maintained with 50% oxygen with nitrous oxide at 4 lit total flow with sevoflurane at 1 MAC and Inj Atracurium 0.1mg/kg top-ups. Inj Diclofenac 75 mg i.v given. Surgical procedure was completed uneventfully and lasted for 1 hour, after that patient was reversed with 100% oxygen, Inj Neostigmine 0.04mg/kg body weight + inj Glycopyrrolate 0.01 mg/kg body weight. Patient was extubated when fully awake and showed sustained head lift for 5 seconds. Patient was observed in PACU for 1 hour on oxygen via face mask. Patient shifted to ward after that. Image: ClearVue Video laryngoscopic view with MAC blade 4, (left to right) before and after external laryngeal manipulation.



**Image 1:** Before external laryngeal manipulation



**Image 2:** After external laryngeal manipulation

## Discussion

We present a case of suicidal ingestion of corrosive substance, with pharyngeal band. Corrosive substance ingestion in the acute phase may result in injuries of the larynx, pharynx, oesophagus. Most common late complications are oesophageal strictures and stenosis, gastric stenosis of the antrum and pylorus, oesophageal and stomach cancer [3, 4]. In our case epiglottitis was found to be

scarred and adhered to surrounding structures with multiple webs and glottic opening located at 2-3 cm in depth with left sided tracheal deviation from midline. Anaesthetic challenges in this patient were, during laryngoscopy and safely securing airway without injury to webs. Conventional rigid laryngoscopy create unavoidable difficulty in securing airway due to distorted upper airway anatomy since glottic opening was not in midline for successful endotracheal intubation. Airway mismanagement remains an important cause of mortality and morbidity in anaesthetic practice [5]. In fact, conventional rigid direct laryngoscopy aids tracheal intubation in 98.1 % of the cases [6]. Thus, alternative equipment and techniques must be readily available for rest of the 1.9 % cases. The various options include: flexible fiberoptic intubation, Intubating Laryngeal Mask Airway [ILMA Fastrach™], Lightwand [Trachlight™], Indirect fiberoptic laryngoscope [Bullard™, Upsher Scope™], gum elastic bougie and retrograde intubation [7]. Awake fiberoptic bronchoscopic intubation with nerve block, use of lightwand, ILMA and retrograde intubation technique could have failed due to distorted upper airway anatomy. One positive point for us was, no difficulty in mask ventilation. We decided to go with RSI using video laryngoscopic intubation with bougie. Difficult airway cart was kept ready. Preoperative flexible nasal endoscopic examination by otorhinolaryngologists is of immense help in planning airway and anaesthesia management strategies. It is always easier to manage anticipated difficult airway than unanticipated difficult intubation. Divatia *et al* and Chen *et al* favor the use of fiberoptic intubation to secure the airway in such cases. 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 [8, 9, 10, 11]. The most recent recommendations from the American Society of Anesthesiologists strongly endorse the use of video laryngoscopy in the event of intubation difficulty [12]. With our case report, we want to highlight the unusual presentation of the epiglottitis and the surrounding pharyngeal structures post-corrosive ingestion. Standard difficult airway guidelines like DAS and AIDAA help in preparation of such airway. An anaesthesiologist must be well versed with newer and older techniques but still could improvise at the moment with the available means for management of difficult airway.

## Conclusion

Preoperative FOL plays an important role in planning and execution of tailored airway and anaesthetic management. In such scarred anatomy, perfect size endotracheal tube can't be estimated using conventional method. By the combined use of pre-operative flexible nasal endoscopy examination to plan the airway management, and video laryngoscopy aided with bougie and external laryngeal manipulation to carry out the intubation, the screen view enables an assistant to provide accurate and co-ordinated help. We were able to tackle this challenging airway with video laryngoscope, easy to use, less time consuming, good success rate and safe without injuring the webs and bands in single attempt successful intubation. Keeping a difficult airway cart with intubation aids, can never go wrong.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has/have given his consent for his images and other clinical information to be reported in the journal. The patient 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.

**Conflict of Interest**

Not available

**Financial Support**

Not available

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