

## Anaesthetic management of endoscopic repair of Zenker's diverticulum

Sir,

Zenker's diverticulum (ZD) is a rare acquired disorder (incidence 1 in 800) presenting in the 6th to 9th decades of life.<sup>[1]</sup> ZD results from posterior herniation of oesophageal mucosa into Killian's triangle, an area of least resistance situated above the cricopharyngeus and below the inferior pharyngeal constrictor muscle [Figure 1].

Symptoms start with complaints of food sticking in the throat and increased swallowing time. The sac enlarges with time and may cause noisy swallowing, regurgitation and bouts of coughing while lying down as was present in the index case. Recurrent pneumonia and lung abscess may develop. A barium swallow study is diagnostic.<sup>[2]</sup> Dysphagia frequently causes malnutrition with resultant hypoproteinaemia and muscle wasting. Treatment aims at dividing the cricopharyngeus muscle and resecting the pouch either openly or endoscopically.

The presence of a diverticular pouch in the pharynx poses several problems. Oral premedications are not suitable as the tablets may get lodged in the pouch and either be ineffective or be aspirated into the lungs.<sup>[3]</sup> Regurgitation of material from the pouch into the lungs during anaesthetic induction is a major concern.

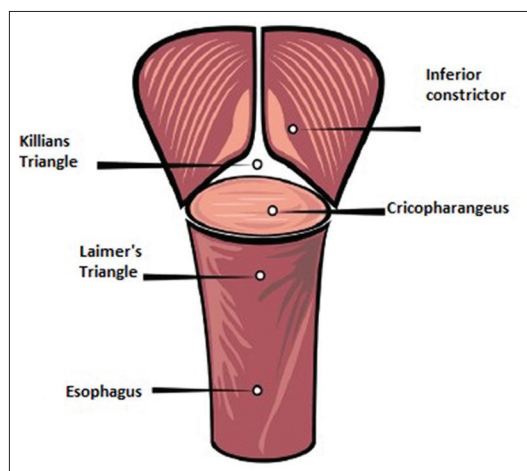
Fasting before surgery is extremely important. Voluntary, self-induced regurgitation of food by the patient before induction is encouraged; this may

empty the pouch. Herein, we discuss the anaesthetic management of endoscopic repair in a 60-year-old patient with ZD with an anticipated difficult airway.

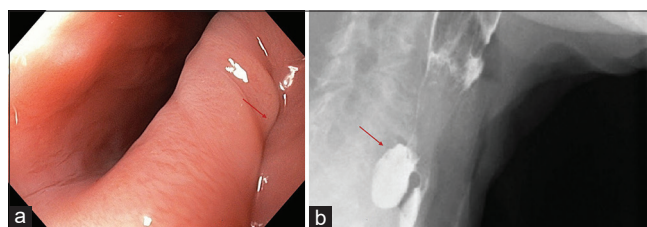
A 60-year-old male (80 kg, 163 cm height) presented for Zenker's Peroral Endoscopic Myotomy. Airway examination revealed a modified Mallampati grade 4, short and thick neck, restricted neck extension, and reduced thyromental distance. Consent was obtained for sharing case details. Endoscopic view of Zenker's diverticulum and barium swallow of Zenker's diverticulum has been shown in Figure 2a and b. The patient was explained awake fibre-optic intubation but was anxious and refused the same. Hence, rapid sequence intubation (RSI) was planned. Plan A for airway management was C-MAC videolaryngoscope-guided bougie-aided intubation, and plan B was fibre-optic-guided intubation. Preoxygenation was followed by RSI with fentanyl 150 mcg, propofol 120 mg and succinylcholine 120 mg. We proceeded with intubation under C-MAC guidance with size 4 blade but obtained a percentage of glottic opening (POGO) 0% view. A D-blade was then used, which improved vision, and the patient was intubated with # 8 mm ID cuffed bougie-guided endotracheal tube.

In these cases, after a smooth induction, video-guided intubation with options of C-MAC or fibre-optic bronchoscope should be targeted. We used C-MAC video laryngoscope for intubation because of an anticipated difficult airway and to intubate under direct vision for prevention of endotracheal tube from entering the path of least resistance into the oesophagus and perforating the diverticulum. For the same reason, bougie should be used for railroading the ETT for additional safety.

Literature search suggests even the use of awake fibre-optic bronchoscope guided intubation in patients with large pouch extending to the mediastinum or an orifice above the cricoid ring.<sup>[2]</sup> This is helpful since airway reflexes are maintained. In our case, we decided on using C-MAC as the first modality for laryngoscopy as there was no restriction of mouth opening or distorted anatomy that might have caused difficulty in



**Figure 1:** Anatomical surroundings of Zenker's diverticulum



**Figure 2:** (a) Endoscopic view of Zenker's diverticulum. (b) A barium swallow of Zenker's diverticulum

visualisation of glottis. C-MAC is also easier technically and less time-consuming. The flexible fibre-optic bronchoscope was kept ready as Plan B.

Regional anaesthesia is also an option; a case is reported of open ZD resection under combined bilateral superficial and deep cervical plexus block, in a patient of ankylosing spondylitis with a difficult airway.<sup>[4]</sup>

Cricoid pressure is useful only if the orifice of the diverticulum is below the cricoid cartilage. Besides, the pressure may have a deleterious consequence of increasing regurgitation from the pouch and causing aspiration. The Barium swallow should be discussed preoperatively with the endoscopic surgeon to identify the level of pouch opening. Use of succinylcholine, without a defasciculating dose of non-depolarising relaxant, is also questionable. The fasciculations caused by its use in the surrounding skeletal muscles may increase pressure within the pouch and cause regurgitation.<sup>[5]</sup> A smooth expedited induction with no coughing/straining in a 10–30-degree head-up tilt with adequate preoxygenation, hypnotic supplemented by opioid/lignocaine, and a dose of non-depolarising muscle relaxant with gentle ventilation should be the aim.<sup>[1]</sup> Once the endotracheal tube is in place, a moist gauze pack placed to surround the tube will prevent regurgitation during surgery.

A nasogastric tube should be carefully inserted, it may be done with C-MAC. During difficult intubation, blind attempts at intubation of the trachea may perforate the pouch resulting in mediastinitis<sup>[6]</sup> and should not be done.

In summary, patients with ZD may have cardiac and pulmonary complications and suffer from malnutrition. Review of the patient's barium swallow X-ray will indicate the size and the position of the pouch opening. Parenteral premedication; voluntary, self-induced emptying of the pouch before induction, gentleness during intubation and packing around the endotracheal tube will minimise spillage of pouch contents into the pharynx and decrease the aspiration risk.<sup>[5]</sup>

#### 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 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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#### Conflicts of interest

There are no conflicts of interest.

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