A call for anaesthesia from the gastrointestinal (GI) endoscopy suite always stirs up anxiety even in the most experienced anesthesiologist. This is mainly due to the hassles of non-operating room anaesthesia (NORA) including the inadequacy of resuscitation and airway-related equipment, monitoring devices, drugs, trained personnel, unfamiliar surroundings and non-availability of immediate help. Secondly, the presence of liver disease and its associated features like ascites, coagulopathy, bleeding disorders, hypoproteinaemia and anaemia can produce huge physiological disturbances of concern to the anaesthesiologist. Comorbidities such as diabetes mellitus, hypertension, conservatively treated ischaemic heart disease on medication, obesity and obstructive sleep apnoea are not uncommon in patients undergoing endoscope-guided intragastric balloon insertion. The anaesthesiologist also has to share the airway with the endoscopist, face the challenges of intubation with the gastroscope in situ and the risk of variceal bleeding in some patients. Nevertheless, nowadays, the number of patients presenting for upper GI endoscopic procedures is on the rise and there is a wide variety of procedures which range from minor procedures to major procedures such as endoscopic-retrograde cholangiopancreatography (ERCP), endoscopic ultrasound (EUS) and spyglass cholangioscopy.

Studies have shown that general anaesthesia (GA) with endotracheal intubation is associated with both advantages and disadvantages. The advantages include a better safety profile, lower perforation rates and lesser risk of coughing. Nevertheless, most major GI endoscopic procedures are performed under deep sedation. Deeper sedation, on the one hand, facilitates the endoscopist to perform difficult procedures with ease, improves patient comfort and decreases the chances of awareness; however, on the other hand, it increases the risk of airway complications. Nonetheless, the popularity of propofol-mediated deep sedation is increasing, and deep sedation without intubation is most commonly used for upper GI endoscopy.

In a randomised controlled trial, general endotracheal anaesthesia was found to be associated with a significantly lower incidence of sedation-related adverse events in patients at high risk for sedation-related adverse events undergoing ERCP. In another study, it was found that for patients undergoing an ERCP requiring GA with intubation, the target-controlled infusion (TCI) technique when compared to the standard volatile anaesthesia technique allows better optimisation of GA with lesser peri-operative complications and shorter extubation time.

AN ASSORTMENT OF TECHNIQUES TO CHOOSE

Studies have shown that general anaesthesia (GA) Procedures such as ERCP, EUS and spyglass
cholangioscopy require the semi-prone or prone position, adding to the anaesthesiologist’s woes. These positions prevent airway collapse by exerting gravitational forces and the inserted gastroscope itself acts as a mechanical stent of the airway, thus preventing its collapse.

Yet, studies have reported difficult mask ventilation in 9–20% of the patients in the semi-prone/lateral position. Gentle insertion of a standard laryngoscope, too, becomes difficult in the lateral/semi-prone position due to distortion in the airway anatomy. Desaturation during upper GI endoscopy can occur, and during such times, simple manoeuvres such as neck extension, jaw thrust, chin lift, positive-pressure ventilation using continuous positive airway pressure (CPAP) and newer oxygenation devices such as a high-flow nasal cannula (HFNC) may also be used. Face masks like the endoscopy mask, gastro-laryngeal tubes, bite blocks, Hague airways, safety guards, and nasopharyngeal airways are airway devices that have been tried in relieving airway obstruction and maintaining the airway during upper GI endoscopy.

Emergency intubation in the prone position may be required many a time, especially during spine surgery/endoscopy, and at such times, many techniques have been tried. Fibre-optic bronchoscopy has been used for this purpose in the lateral position in a child with temporomandibular joint ankylosis. Gastroscopic-guided bougie insertion into the trachea followed by endotracheal intubation has also been described in the semi-prone/lateral position.

In an observational study, blind intubation through i-gel was found to have a success rate of 36% and not clinically acceptable. In a randomised crossover mannequin study that compared the airway rescue performance in the prone position of three airway devices, the success rates with the proseal laryngeal mask airway (100%) and Pentax AWS videolaryngoscope (100%) were significantly greater than that with a McGrath video-laryngoscope (71.4%).

In a recently conducted prospective observational study, the researchers found that LMA Gastro had a higher oropharyngeal leak pressure than the gastro-laryngeal tube; however, endoscopist satisfaction was better with the gastro-laryngeal tube.

In contrast, Paul Zilberman and colleagues encountered difficulty in passing the gastroscope through the gastro-channel of the LMA Gastro airway due to negligible size difference between the internal and outer diameter of the LMA and endoscope, respectively. They suggested making a U-shaped cut on the gastric channel of the endoscope to resolve this issue. However, this arrangement has been questioned in an article in a previous issue of the IJA, wherein the authors have suggested design modifications of the device such as a wider gastro-channel, reinforcement of the distal end of the LMA Gastro airway to reduce compression by the inflated cuff and making the distal tip more oblong.

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**A FERTILE AREA FOR INNOVATION AND RESEARCH**

Patient safety during GI endoscopy is of utmost importance, and hence, improvement in respiratory monitoring during upper GI endoscopy and ERCP is another long-felt clinical need. Nonetheless, in an attempt to find a technique superior to pulse oximetry, non-invasive techniques such as EtCO₂ monitoring, impedance monitoring for breathing patterns, infrared
thermography for respiratory rate, oxygen reserve index and acoustic respiratory monitoring have been tried and researched.\[^{[7,25,26]}\]

The steady upcoming of newer airway and monitoring devices entails that the journey in search of a reliable and safe airway device for optimum airway management during upper GI endoscopy and ERCP still continues. Will the LMA Gastro become the new airway mantra (formula) for upper GI endoscopy? Will propofol sedation continue to remain the favourite of anaesthesiologists and endoscopists for ERCP? Only time can decide this; nonetheless, clinical trials including randomised controlled trials on this topic are currently being conducted in different parts of the world.

Innovations and modifications in existing airway devices are taking place, and the battle is now only half won. Guidelines by national and international bodies on sedation during endoscopy have been published from time to time. The recently published clinical practice guidelines for endoscopic sedation have recommended (grade II recommendation) that the physician and the assisting healthcare staff who administer the sedation should be trained in basic life support to deal with fatal sedation-related adverse events. Other recommendations include equipping the endoscopy suite with drugs and equipment for emergency resuscitation, pre-procedure assessment of the patient’s age, body mass index, Mallampati score, American Society of Anaesthesiologists physical status score and a reduction of drug doses, both initial and later doses in the older patient.\[^{[27]}\] However, Indian guidelines in this context are awaited. Also, there is a need to have separate guidelines for minor and major upper GI endoscopic procedures, including recommendations for airway management. That means that research on this topic and the search for the right airway device has to go on.

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