Guest Editorial

Supraglottic airway devices: Standard airway management tool, but still not without concerns

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Supraglottic airway (SGA) devices are widely used for elective airway management and rescue devices in difficult airway management. According to the fourth National Audit Project (NAP4), SGAs were used for airway management in 56% of general anaesthesia.[1] SGAs are also included as rescue devices in all the difficult airway algorithms formulated by various societies worldwide. Despite recent developments in second-generation SGAs, challenges concerning their placement, achieving adequate seal for ventilation and using them as conduits for intubation remain. Use of second-generation SGA is also associated with complications ranging from mild adverse effects like postoperative sore throat, dysphagia, pain on swallowing, or hoarseness to serious issues like aspiration of gastric contents, compression of vascular structures, trauma and nerve injury.[2] The majority of these complications are either device-related (inappropriate use, deviation from manufacturer's recommendations), patient-related (obesity, comorbidities, nonstandard patient positioning) or user-related (traumatic insertion, inexperienced operator). Even though the search for the ideal SGA is ongoing, many of these complications can be avoided by implementing certain modifications to existing devices.

Before attempting SGA insertion, selecting the correct size as per the manufacturer's recommendation and confirming adequate anaesthetic depth are essential. This will increase the likelihood of success on the first attempt. Typically, SGA moves out of the mouth by 1–2 cm after insertion till it comes into contact with the base of the tongue.

Correct placement and alignment to the glottis can be accomplished by performing a Tug test after placing SGAs. In the Tug test, after insertion and inflation of the cuff, the shaft is subjected to a controlled, upward traction until it encounters resistance. This manoeuvre not only ensures placement of SGA above the upper oesophageal sphincter but also releases inadvertent downfolding of the epiglottis. In addition, during the change of position, if any, in the intraoperative period, the base of the tongue holds the device in place and acts like a lever to prevent slipping of SGA into the mouth.[3] This technique ensures proper placement and prevents dislodgement in lateral and prone surgical positions.

Jaw thrust is another useful manoeuvre to determine the adequacy of depth before SGA insertion during induction in both adults and children.[4] Jaw thrust was also helpful during the insertion of I-gel, as suggested by Kumar[5], and this modified technique can be considered whenever difficulty in placement is anticipated. Jaw thrust is also helpful when there is an audible or palpable leak around the SGA device. Jaw thrust with the SGA device *in situ* helps to correct and realign the malpositioned epiglottis (impingement, pushed down to block the larynx or folded). It invariably overcomes the airway obstruction caused by the malpositioned epiglottis. It helps to improve the soft seal and can be used as a temporary measure until a definitive intervention, such as replacing a laryngeal mask airway (LMA) or securing an endotracheal tube, is carried out. Caution should be exercised during the use of SGAs in neonates, as it has a greater tendency to be malpositioned after placement. The tongue in neonates is small compared to the device and does not offer the hold required to keep it in place.

It is imperative to determine the sealing pressure of the SGA device, especially if the surgery is contemplated in the Trendelenburg position. The sealing pressure of the SGA device should be determined in the Trendelenburg position to ascertain that the soft seal is maintained in that position. Similarly, when the use of an SGA device is planned for the laparoscopic procedure in the Trendelenburg position, the sealing pressure should factor in the expected rise in the intra-abdominal pressure (an additional 12 mmHg is the expected rise of intra-abdominal pressure). The SGA device must be replaced with an endotracheal tube if the soft seal is not able to withstand the increase in airway pressure because of the head-down position or rise in intra-abdominal pressure before the start of surgery.

There are numerous case reports of the prolonged use of SGAs in the operating rooms and intensive care units for up to 24 h without adverse effects.[6] If the surgery gets unexpectedly prolonged, the decision should be based on a risk–benefit analysis, considering the patient's airway difficulty, intraoperative surgical position, feasibility and resource availability. However, when SGAs are used for extended periods, it is essential to closely monitor the SGA cuff pressure and respiratory parameters and anticipate complications such as supraglottic mucosal damage, sore throat, vascular compression, nerve damage and the risk of aspiration.

The use of the blind digital insertion technique has been associated with a higher incidence of placement difficulties and improper positioning.[7] The use of introducers with SGAs that are not preformed is a better option, as these devices soften with repeated use and autoclaving. Further, to increase the first attempt success rate and correct placement of SGA, video laryngoscope–guided SGA insertion is effective.[8] Considering the benefits of this technique, many researchers have suggested the need for camera vision-guided SGA placement, which may have benefits like real-time visualisation of insertion, enabling quick manoeuvres to optimise position and verifying appropriate size and placement.[9] SaCoVLM™ is a newly developed video laryngeal mask that integrates visualisation technology with the second-generation LMA to facilitate real-time visualisation of glottic and surrounding structures.[10] It can also facilitate direct vision tracheal intubation and real-time monitoring of periglottic conditions.

Newer advancements in SGAs have made airway management of critical cases easier for anaesthesiologists but have posed some challenges for surgeons. One example is using LMA® Gastro™ Airway for upper gastrointestinal (GI) endoscopic procedures. With LMA Gastro, endotracheal intubation can be avoided in sick patients requiring general anaesthesia for upper GI endoscopy.[11] Though it is a boon for anaesthesiologists, authors observed a reduction in the first-pass success rate of the endoscope through this SGA. Endoscopists also encountered difficulty manoeuvring the scope as it fits snugly into the gastric tube. This resulted in multiple attempts of endoscope insertion, prolonged procedure time and endoscopist fatigue, especially when complex interventions were planned. Further modifications are required to make it universally acceptable by endoscopists for diagnostic and interventional procedures.

To conclude, SGAs have witnessed numerous modifications since their introduction, but their use is not without problems. Nevertheless, SGAs can be made safer through vigilant monitoring, improvements to techniques and innovations.

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