SLIPA™ may be more useful than other LMADs for difficult airway management

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Received: 24 August 2011 / Accepted: 30 September 2011 / Published online: 13 October 2011
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To the Editor,

The SLIPA™, a cuffless, hollow, boot-shaped, soft plastic supraglottic airway device (SLIPA; SLIPA Medical Ltd., London, UK), has advantages over other laryngeal mask airway devices (LMADs) because it provides better protection from regurgitation and has a better perilaryngeal seal.¹ However, SLIPA™ has not been tested in difficult airways. We report successful management of a difficult airway with SLIPA™ after laryngeal mask airway failure. We obtained the patient's written consent to publish this report.

A 50-yr-old man (169 cm, 90 kg) with gastroesophageal reflux disease (GERD) was scheduled for reconstruction of finger tendons under general anesthesia. Difficult intubation was anticipated because of the patient's large tongue, short neck, thyromental distance, and a Mallampati score of 4. Because he refused awake fiberoptic intubation, we decided to insert a LMAD. After administering fentanyl 100 µg, thiopental sodium 450 mg, and succinylcholine 90 mg, a LMAD (Solus™; Intersurgical Ltd. Wokingham, UK) size 5 was inserted. Immediately after insertion, no leak was heard, the end-tidal carbon dioxide concentration (ETCO₂) was 28–30 mmHg, and the peak inspiratory airway pressure (PIP) was 22–25 cm H₂O. At one minute after insertion, however, the PIP suddenly increased to 35 cmH₂O, and a leak was detected. The LMAD was removed, and another insertion attempt was made after administering succinylcholine 50 mg. This time, the PIP

was 40–45 cm H₂O, and leaks were audible immediately. A fiberoptic bronchoscope (FOB) was inserted through the airway port of the LMAD, and the anterior portion of the epiglottis was found to be blocking the view. The fibroscope was passed under the epiglottis to examine the glottis, and a glottic narrowing was found.

After removing the LMAD, a size 55 SLIPA™ was inserted. The PIP decreased to 20–23 cm H₂O, and the ETCO₂ was 32–33 mmHg. No leak was detected. The FOB was inserted, through which the vocal cords were well visualized, and the periglottic seal was seen to be improved. Afterward, ventilation was maintained well, and there were no complications, including airway obstruction or aspiration.

Examination of the glottis via the FOB provided possible explanations for the different performances of the two devices. First, the position of the epiglottis was different, which might be due to the designs of the respective bowls. The laryngeal aperture of SLIPA™ consists of a wide portion and a narrow portion, preventing airway obstruction (Figure), whereas the absence of epiglottic bars on the Solus™ could cause epiglottis downfolding and subsequent airway obstruction. However, previous reports suggested that because disposable LMADs, including the Solus™, have a deeper bowl, ventilation is well maintained despite the absence of epiglottic bars.^{2,3} In this case, the FOB passed under the epiglottis with ease, which makes obstruction by the epiglottis improbable.

Second, the presence of a cuff and the shape and location of the bowl should be considered. The space between the tongue and posterior pharyngeal wall was probably narrow in this patient, becoming narrower because of laryngopharyngeal edema caused by GERD. In a narrow space, inflating the LMAD cuff could increase pressure in the laryngopharynx and cause distortion of laryngeal

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Figure The Solus™ laryngeal mask airway device (LMAD) (left) and SLIPA™ (right). The laryngeal aperture of the SLIPA consists of a wide part (thick white arrow) and a narrow part (thin white arrow). An epiglottis that is prone to downfolding is easily accommodated in the wide portion without causing obstruction. Furthermore, the narrowed portion prevents an epiglottis prone to downfolding from closing the glottis. Finally, the bowl of SLIPA is nearer to the apex as compared with the LMAD bowl (solid black lines)

structures, leading to glottic narrowing, increased PIP, and LMAD leakage, all of which interfere with ventilation. In contrast, SLIPA™ is cuffless; its tip is slimmer and more pointed, its width is narrower, and its bowl is located distally (Figure), causing less distortion of laryngeal structures. This hypothesis is supported by the adequate periglottic seal and visible glottis without the narrowing seen via the FOB through the SLIPA™. Therefore, the SLIPA™ could produce a good seal even in patients with a narrow pharyngeal space.

Third, the SLIPA™ might have a better sealing mechanism. The heel of the SLIPA™ is placed in the nasopharynx, providing an additional seal that increases leak pressure. Previous studies have demonstrated that the leak pressure of SLIPA™ (reported means were 27,¹ 24,⁴ and 30 cm H₂O)⁵ is greater than that of other LMADs (23 cm H₂O).²

In conclusion, we believe that SLIPA™ may be more effective than LMAD in difficult airway management, especially in patients whose pharyngeal space is narrow and in whom the PIP is high.

Funding No funding was obtained for this work.

Conflicts of interest None declared.

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