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Esophageal Intubation Detector-Bulb: A New Use with the ProSeal™ Laryngeal Mask Airway

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Introduction: The ProSeal™ Laryngeal Mask (PLMA) is a new airway device with two lumens – an airway tube which is in continuity with the patient's tracheo-bronchial tree and the drain tube (DT) which is in continuity with the esophagus.[1] Several tests have been described to verify correct placement of the PLMA.[2, 3] The suprasternal notch (SSN) test is the most important since a positive test suggests that the distal aperture of the DT is located over the esophageal inlet behind the cricoid cartilage. We present a patient in which the Esophageal Intubation Detector-Bulb ™ (EID) was used to facilitate correct placement of the PLMA.

Case Report: A healthy 14-year-old male (60kg, 164cm) presented for a right inguinal hernia repair. Since he did not want an intravenous access placed awake, an oral premedication with midazolam and acetaminophen was given. Following inhalational induction with O_2/N_2O/sevoflurane, an intravenous catheter was placed and propofol 100mg, rocuronium 30mg and fentanyl 100mcg given. A size 4 PLMA was inserted using the finger insertion technique.[2] The cuff was inflated with air to a pressure of 60cm H_2O and positive pressure ventilation (PPV) performed easily with a resulting normal capnograph. A compressed Esophageal Intubation Detector-Bulb™ (Wolfe Tory Medical, Inc., Salt Lake City, UT, USA) was attached to the airway tube. The bulb re-inflated almost immediately. Using an endotracheal tube (ETT) adapter over the DT, the same procedure was repeated. No bulb re-inflation was observed. The SSN test was then performed using surgical lubricant applied to the top of the DT. Bubbles were observed when the SSN was tapped. No bubbles were observed with PPV or chest compression. The oropharyngeal leak pressure was 26cm H_2O with no leak from the DT, confirming a mask/esophageal seal. The maximum minute ventilation (MMV) test was then performed and a value of 24 liters was obtained indicating the absence of supraglottic obstruction by the PLMA.[4] A 14F Salem sump gastric tube passed easily via the DT with return of gastric juice.
Anesthesia was maintained with an O_2/N_2O/sevoflurane mixture with PPV. The rest of the anesthetic and surgery were uneventful and the patient was transferred to the recovery room where the PLMA was removed without event.

Discussion: Studies have confirmed the efficacy of the EID-B in detecting correct positioning of the classic laryngeal mask airway (CLMA) and the esophageal/tracheal Combitube™.[5,6] One study found a high incidence of false positives with the CLMA in children.[7] To our knowledge, there has been no previous report of the use of the EID-Bulb in assisting in PLMA positioning. The principle behind the EID bulb is that, after compression, it reinflates if there is no obstruction to air entry. The trachea is held open by cartilaginous rings whereas the esophagus lacks any rigid structure to maintain its patency. Therefore, the esophagus readily collapses when negative pressure is applied to its lumen obstructing the end of the DT and air entry into the EID-bulb. When placed correctly at the upper esophageal sphincter, the DT of the PLMA can be considered an extension of the esophagus. A positive test (no cuff re-inflation) most likely suggests correct placement of the distal aperture of the DT over the esophageal inlet. The EID-Bulb test may therefore complement the SSN test in confirming correct positioning of the PLMA and in the assessment of a malpositioned or malfunctioning PLMA. Further investigation of the use of the EID-bulb for verifying proper PLMA positioning and function is warranted.

References:

1. Brain AIJ, Verghese C, Strube PJ. The LMA 'ProSeal'-a laryngeal mask with an esophageal vent. Br. J. Anaesth 2000; 84:650-4.
2. LMA™ Airway Instruction Manual. San Diego: LMA North America, 2003.
3. O'Connor CJ Jr, Borromeo, CJ, Stix MS, Brimacombe J, Keller C, Berry A, Mitchell, S: Assessing ProSeal Laryngeal Mask Positioning: The Suprasternal Notch Test. Anesth Analg 2002; 94: 1374-5
4. Stix MS, O'Connor CJ. Maximum Minute Ventilation Test for the ProSealTM Laryngeal Mask Airway. Anesth Analg 2002; 95: 1782-7
5. Wafai Y, Salem MR, Tartaglione A, et al. Facilitation of positioning of laryngeal mask airway by the self-inflating bulb. Anesthesiology 1994; 81:A628
6. Wafai Y, Salem MR, Baraka A. Effectiveness of the Self-Inflating Bulb for verification of the Esophageal Tracheal Combitube™. Anesth Analg 1995; 80: 122-6
7. Burnett YL, Brennan, MP, Salem MR. Comparison of end-tidal CO_2, fiberoptic scope, self-inflating bulb and chest wall movement for correct laryngeal mask placement in pediatric patients. Anesthesiology 1994; 81: A1388