Easy way of improving seal with Rendell-Baker-Soucek mask: Old equipment revisited

Sir,

Rendell-Baker-Soucek (RBS) face mask has been used for mask ventilation in pediatric patients. It reduces dead space to a quarter of anatomical facemasks with inflatable pad but has the disadvantage of not providing padded seal.\textsuperscript{[1-3]} This makes the use of RBS face mask inadequate in cases where mask holding is difficult, especially when the anesthesiologist has had limited experience with the pediatric airway. At times, it is not possible to obtain adequate seal even with two-hand technique. Further, when the duration of anesthesia is brief or endotracheal intubation is planned, the issue of dead space seems less important than the ability to deliver positive pressure ventilation. As a result, a very few centers now use these masks. However, a simple modification in the RBS mask could improve its seal in difficult situations. We report three cases wherein difficult mask ventilation was encountered and managed successfully with the modified RBS face mask.

Case 1: A 5-year-old malnourished male child with shrunken cheeks was posted for unilateral pyeloplasty. Even with two-hand technique, size 2 RBS mask failed to provide an adequate seal for adequate positive pressure ventilation after induction of anesthesia.

Case 2: A 6-year-old male patient developed laryngospasm following removal of laryngeal mask airway at the end of hernia repair. Continuous positive airway pressure (CPAP) was applied in an attempt to treat laryngospasm and maintain oxygenation. Size 2 RBS face mask, though used successfully to ventilate the lungs at induction, failed to provide an effective seal during CPAP therapy.

Case 3: A female patient of age 5 years and 6 months with empyema was posted for decortication surgery. Adequate ventilation could not be provided with size 2 RBS mask due to poor compliance and inadequate seal between the face and the mask. This resulted in rapid desaturation.

An alternate means of obtaining seal in these cases was by mounting/applying foam pad of head phone over the perimeter of the face mask [Figure 1]. This improved the seal and adequate mask ventilation was obtained without difficulty, even with one-hand technique. Further, the effective dead space of the equipment was not increased as the body of the detachable foam pad mainly fell within the cavity of the face mask [Figure 2], especially when pressure was applied in an attempt to obtain tight seal between mask and face. Thus, this modification to the RBS mask retains the benefits of low profile of the mask while providing foam pad to it. We recommend that a preformed detachable foam pad according to the size of respective RBS face mask can be provided by the manufacturer, to be used in case of difficult seal and mask ventilation.

Figure 1: RBS face mask and foam pad of head phone. Arrow points the groove in the foam pad where margins of the mask fit.
Pneumothorax during laparoscopic cholecystectomy: A rare but fatal complication

Sir,

A 30-year-old ASA physical status I female weighing 60 kg presented to us for laparoscopic cholecystectomy. The patient received general anesthesia with standard drugs. Postintubation patient was put on ventilator to achieve normocapnia (end-tidal CO$_2$ 35-40 mmHg). After 30 minutes of incision when gall bladder had been separated from the fossa, there was a sudden rise in the heart rate 110/minute, decrease in oxygen saturation to 85%, decreased breath sounds with hyper-resonant note on percussion on the right side and increased airway pressure to 30-35 mmHg suggestive of pneumothorax. Patient was put on 100% O$_2$ and shifted onto manual ventilation immediately. Keeping a differential diagnosis of bronchospasm and pneumothorax in mind, muscle relaxation was enhanced; patient was nebulised with bronchodilators (salbutamol through the endotracheal tube), corticosteroids and trachea was suctioned. But all these did not improve the clinical scenario. Since surgery was near completion, it was decided to proceed with surgery. Any injury to the diaphragm was ruled out and the pneumoperitoneum was deflated. Subsequently, oxygen saturation (increased to 95%), other parameters (end-tidal CO$_2$ and PR decreased to 40 mmHg and 90/min, respectively) and clinical findings (improved air entry on the right side) improved. Her trachea was extubated and she was shifted to SICU. Postoperative CXR confirmed right-sided pneumothorax. The patient was put on parenteral antibiotics, oxygen by facemask and close monitoring in the intensive care unit. After confirming fully expanded lung with clear costophrenic angles on CXR, the patient was discharged on 4th postoperative day.

The known risk factors for a pneumothorax in laparoscopic surgery include a long surgical time (>200 mins), end-tidal CO$_2$ 50 mmHg, old age and unskilled surgeons. This can occur spontaneously, rupture of emphysematous bullae due to barotraumas, due to direct injury to the diaphragm during dissection of gall bladder off the liver bed or leak of carbon dioxide through the congenital weakness in the diaphragm leading to pneumomediastinum and subsequent spontaneous pneumothorax.

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