A Novel Nasal PAP Mask Assembly Maintained Spontaneous Ventilation and Oxygenation in an Obese Pediatric Patient during EGD at an Adult Endoscopy Suite

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Introduction: Patients undergoing GI endoscopy often receive IV sedation and O2 via nasal cannula. Nasal cannula delivers inadequate O2 when the mouth is kept open by the bite-block during EGD. Over-sedation and/or airway obstruction may cause severe desaturation, especially in obese patients with OSA. In severe cases, the procedure has to be interrupted in order to resuscitate the patient with assisted face mask ventilation or endotracheal intubation.

A simple nasal PAP mask assembly has been shown to maintain ventilation and improve oxygenation by delivering nasal CPAP or BiPAP or PPV in patients with OSA during sedation, GA or awake/asleep ETI (1-4). However, it has seldom been used in pediatric patients (5-6). We used it in an obese child during EGD.

Case Description: A 15-year-old child with obesity presented for screening EGD prior to bariatric surgery. The patient had a BMI of 42.3 kg/m2 (159 cm, 106.9 kg) and a Class II airway. A modified infant mask (pediatric size #2) with fully-inflated air cushion was shown to the patient and the parent. The patient was fitted with the mask over the nose and breathed through it comfortably.

After the patient assumed LLD position, an infant mask was secured over the nose with elastic head-straps (Photo). It was connected to the anesthesia machine via a long breathing circuit. The patient was pre-oxygenated with 4 L O2/min and 3-5 cm H2O CPAP by adjusting the APL valve. The patient received 100 mg of lidocaine, and three 50 mg boluses of propofol and propofol infusion (150 mcg/kg/min). The patient maintained 100% SpO2 and stable hemodynamics throughout the procedure.

The patient tolerated the procedure well and was woken up in the room without a problem. Since the patient was a pediatric patient, it would violate the Hospital Rule if the child stayed in Adult Endoscopy Recovery. The Nursing Management refused to break the rule.

The anesthesia team monitored the patient in the procedure room until the patient was fully awake. The patient received O2 via a nasal cannula with a simple face tent (1) during a long transport (9 minutes) to the 7th floor pediatric PACU without incident.

Discussion: This simple nasal PAP mask assembly was used to maintain spontaneous ventilation and provide continuous oxygenation in an obese pediatric patient during an EGD screening for bariatric surgery. A pediatric face mask was modified slightly from the tear-drop shape to fit the
nose. This simple nasal mask assembly utilizes a pediatric face mask and existing anesthesia equipment and machine and may improve patient safety at a low cost.