A Novel Nasal PAP Mask Assembly Maintained Spontaneous Ventilation and Oxygenation in a Morbidly Obese Patient with OSA and History of Sedation-Induced Apnea and Severe Desaturation during Repeated Attempt of Colonoscopy

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Introduction: Patients under monitored anesthesia care (MAC) often receive intravenous sedation and supplemental O2 via nasal cannula. Over-sedation and/or airway obstruction may cause oxygen desaturation, especially in obese patients with obstructive sleep apnea (OSA). In severe cases, the procedures have to be interrupted in order to resuscitate the patient. A simple nasal PAP mask assembly using a pediatric mask and existing anesthesia equipment and machine has been shown to maintain spontaneous ventilation and improve oxygenation in sedated obese patients with OSA .1-5

We report its use in a morbidly obese patient with OSA and history of sedation-induced apnea and severe oxygen desaturation during colonoscopy under MAC.

Case Description: A 60 year-old male, 6'1", 342 lb, (BMI 46 kg/m2) with hypertension on metoprolol and furosemide, a history of atrial fibrillation s/p ablation, OSA on nocturnal CPAP support presented for outpatient colonoscopy. His previous colonoscopy was aborted because of severe oxygen desaturation due to apnea with sedation. He was advised by the previous anesthesiologist to inform the future anesthesia care team of that desaturation episode. He had a Mallampati Class III airway, 3 cm mouth opening and full range of motion of the neck.

After an infant mask (size #2) with fully inflated air cushion was secured over his nose with elastic head straps and connected to an anesthesia breathing circuit and the anesthesia machine, the patient assumed LLD position (Photo). The APL valve was adjusted to deliver 8-10 cm H2O CPAP with 10 L/min O2 flow.

Following nasal mask pre-oxygenation, his SpO2 increased from 96% to 100%. Deep sedation was then titrated slowly with midazolam (2 mg), lidocaine (100 mg) and propofol boluses (3 x 50 mg) and propofol infusion (150 mcg/kg/min). At the beginning of colonoscopy, his BP increased from 165/101 to 185/94 mm Hg and HR from 74 to 78. Propofol infusion was briefly increased to 200 mcg/kg/min and his SpO2 only decreased to 98% for 5 minutes. Small boluses of metoprolol (a total of 5 mg) were given and his BP maintained at 150â€“160â€”s/70â€“80â€”s and his HR 60â€“70â€”s.

The patient maintained spontaneous ventilation with respiratory rate of 18-22 breaths/min and 99-100% SpO2 throughout the 36-minute colonoscopy. The patient tolerated the procedure well
without any complication. He was elated that colonoscopy was completed and oxygen desaturation was avoided. He was discharged home without any problem.

Discussion: This simple nasal PAP mask assembly maintained spontaneous ventilation and improve oxygenation in a morbidly obese patient with OSA and previous sedation-induced apnea and severe desaturation. It utilizes a pediatric face mask and the existing anesthesia equipment/machine and takes less than two minutes to prepare. With a tight nose-mask seal and APL valve adjustment, low flow of O2 (4 L/min) is often needed to provide optimum CPAP. It can also be used to deliver immediate assisted nasal ventilation in case of apnea and may improve patient safety at a low cost.

Case reports are IRB-exempted. A patient’s consent was obtained for photography.