A Novel Nasal TSE-PAP Mask Assembly Provided Continuous Active Oxygenation in a Paediatric Patient with OSA during Induction of GA for Appendectomy

James Tse, PhD, MD, Benjamin R. Landgraf, MD, Bhounesh Patel, MD,
Usman Shah, MD, Sylviana Barsoum, MD

Dept. of Anesthesiology, Rutgers Robert Wood Johnson Medical School,
New Brunswick, New Jersey, USA

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Background: Patients with OSA can provide difficulties with oxygenation and ventilation after general anaesthesia (GA) induction.

A nasal TSE-PAP mask assembly has been shown to maintain oxygenation by delivering nasal CPAP, BiPAP or PPV in adult patients with OSA during sedation, GA or awake/asleep endotracheal intubation (ETI).¹⁻⁵ However, it has rarely been used in paediatric patients.⁶⁻⁷

We used it in a paediatric patient with OSA for GA induction for laparoscopic appendectomy.

Case Report: A 8-year-old, 133 cm, 42 kg, male with OSA s/p tonsillectomy and adenoidectomy (T&A), presented with acute appendicitis for laparoscopic appendectomy on a Saturday. His father described some difficulty breathing at night in the patient consistent with OSA despite past T&A. His father gave his consent to use a nasal mask and for taking photographs for case-report.

The patient received 2 mg midazolam and was transported to the OR in a calm manner. An infant mask (#2) with fully inflated air cushion was secured over his nose with head-straps. It was connected to a breathing circuit/machine with 4 L O₂/min and 1L /min air. APL valve was adjusted to deliver 5 cm H₂O CPAP (Fig. 1).

He then received 40 mg lignocaine, 50 mg propofol and 20 mg rocuronium. His mouth was closed and a tight nasal mask was obtained with one hand. Nasal ventilation was easily accomplished.

With the nasal mask delivering apnoeic oxygenation, a #2 blade video-laryngoscope was inserted which revealed a class I airway. A 6.0 ETT was inserted to 16 cm and secured (Fig. 2-3).

His SpO₂ remained 100% throughout.

Fig. 1. An infant mask secured over the nose and delivered CPAP pre-oxygenation.

Fig. 2. The nasal mask delivered continuous apnoeic oxygenation during oral suctioning.

Fig. 3. The nasal mask delivered continuous apnoeic oxygenation during VL endotracheal intubation.

He tolerated the procedure well. Immediately post-extubation, he received the same nasal mask with 5 cm H₂O CPAP.

A bag-valve device was used to deliver nasal CPAP during a long transport from the 1st floor OR to the 7th floor paediatric PACU without incident.

Discussion: This simple nasal TSE-PAP mask assembly was used to provide continuous active oxygenation in a paediatric patient with OSA during GA induction.

Besides CPAP pre-oxygenation, it provided means to deliver assisted nasal ventilation, apnoeic oxygenation during VL ETI and CPAP during long but safe transport to paediatric PACU. It may improve patient safety at a low cost.

Ref: 1. www.TSEMask.com; 2. SAMBA 28th AM, 2013; 3. SASM 3rd AM, 2013; 4. ASA AM, 2013; 5. SAM AM, 2014; 6. ASA AM, 2015; 7. SPA-AAP, 2016

Learning Points: How to prepare a nasal mask assembly and to provide nasal CPAP in paediatric patients and assisted nasal ventilation in patients with OSA.