Nasopharyngeal airway size selection and its implication in the management of pediatric difficult airway

Dear Editor,

Choosing an appropriate size nasopharyngeal airway (NPA) is essential to maintain airway patency and optimize ventilation while minimizing complications. We report our experience with the NPA while attempting to intubate a 13-year-old boy weighing 25 Kg, who had unilateral congenital temporomandibular joint ankylosis with micrognathia and was scheduled for mandibular distraction surgery. We had planned to perform fiberoptic bronchoscope (FOB) guided intubation while maintaining spontaneous ventilation following an inhalational induction. Under standard monitoring, anesthesia was induced with incremental doses of sevoflurane in oxygen. With increasing anesthetic depth, the child developed substernal retractions and paradoxical abdominal movements indicating respiratory distress which were not relieved with head tilt-chin lift maneuver. Hence, a well-lubricated 6 mm internal diameter NPA (Argyle™, Covidien, Ireland) was inserted to relieve the obstruction. The NPA size was selected based on the nares to tragus distance and nostril diameter of the child. In spite of multiple adjustments and advancing the NPA till its flange, airway obstruction persisted. Suspecting that the previously inserted NPA was insufficient in length to relieve the airway obstruction, we replaced it with a second NPA (Rusch, Teleflex, USA) of same internal diameter and adjustable flange. In a spontaneously breathing patient, advance the NPA gently till the air blast is felt or capnographic trace is regular. Subsequently FOB-guided intubation was successfully performed through the other nostril and the tip of the NPA was observed to be just in front of the larynx effectively bypassing the tongue and epiglottis.

The investigation has suggested that the external diameter of nares and little finger did not aid in appropriate selection of NPA in a magnetic resonance image-based study. Stoneham found that clinical measurements like nares to tragus distance, nares to mandible distance and mento-hyoid distance did not correlate with the nares to epiglottis (NE) and larynx (NL) distance. It was found that the NE and NL distances had a wide range and correlated best with height.

Although pediatric nomograms to select appropriate NPA based on nares to mandible distance, and height of the patient are available, their use may be limited by variations in anatomy. The selection of ideal length and diameter NPA beforehand is important to avoid the risk of repeated manipulations and hence airway trauma and bleeding. In a situation like ours, where FOB-guided intubation was planned, it was essential to have a bloodless field. It is clear from the literature that the length more than the diameter is important for successful NPA placement and the NE distance is a highly variable parameter even within the same age group. Commercially available NPA have different length for a given internal diameter, which varies among manufacturers. We suggest choosing an NPA based on the diameter that has a maximum length preferably with an adjustable flange. In a spontaneously breathing patient, advance the NPA gently till the air blast is felt or capnographic trace is obtained, and fix it at that length. Ideal position of the tip of NPA will be just above the epiglottis, so that airway obstruction is relieved. And If inserted beyond, it may enter the larynx causing cough, laryngospasm, and trauma to cords or enter into esophagus causing gastric insufflation, nausea, and vomiting.
Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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