

Infant with unanticipated difficult airway - Trachlight™ to the rescue

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Abstract

Lighted stylets may be used for assisting in oral intubation in both adult as well as pediatric age groups. We report the anesthetic management of an 11-month-old infant with fractured mandible where the airway was secured with tracheal lightwand-guided nasal intubation after the failure of repeated attempts of conventional laryngoscopy.

Key words: Difficult airway, pediatric, trachlight

Introduction

Unanticipated difficult pediatric airway often presents unique challenges. In the case of difficult direct laryngoscopy, oxygenation and ventilation can still be managed by supraglottic devices and most surgeries can proceed. Oral surgeries need better securing of the airway, and in most cases, a nasal endotracheal tube (ETT) is essential. We present the airway management of an infant in which we successfully accomplished light-guided nasal intubation using the Tracheal Lightwand, after failure of direct laryngoscopy guided nasal intubation.

Case Report

An 11-month-old infant, weighing 9-kgs, presented with a one day history of facial trauma and subsequent pain and tenderness over the lower jaw. Radiological investigations revealed an undisplaced fractured symphysis of mandible and the child was scheduled for circum-mandibular wiring under general anesthesia. Airway examination revealed a

normal neck extension. Mouth opening was judged while the child was crying and was found adequate. As the surgical procedure required an assessment of teeth occlusion, nasal intubation was necessary. Nasal patency was checked with a wisp of cotton placed against each nostril and the nostril with better airflow was chosen for intubation. A written informed consent was taken from the parents and adequate fasting was ensured preoperatively.

On the morning of surgery, prilocaine cream was applied on the dorsum of the left hand and after 45 min, an intravenous (IV) access was established. On arrival in the operation theatre, standard monitors were applied. The patient was premedicated with glycopyrrolate 0.1 mg and butorphanol 0.15 mg IV. Nasal decongestion was achieved by instilling 0.05% xylometazoline nasal drops through each nostril before attempting tube passage. After preoxygenation with 100% oxygen for 3 min, anesthesia was induced with propofol 20 mg IV and maintained with a 1:1 nitrous-oxide:oxygen mixture and 1% isoflurane. After ensuring adequate bag and mask ventilation (BMV), atracurium 4 mg IV was given for neuromuscular blockade. The nasal cavities were lubricated with lidocaine gel 2% and dilated progressively using nasopharyngeal airways size 3.0, 3.5, and 4.0 mm. After 3 min of BMV, a well-lubricated, uncuffed, 4-mm internal diameter (ID) flexo-metallic ETT was inserted through the more patent nostril to reach the oropharynx. Direct laryngoscopy revealed a Cormack-Lehane grade-4 view. Manipulation of the tip of the tube into the trachea with the help of Magill's forceps was attempted thrice, but was unsuccessful. Ventilation was resumed with the help of a facemask, and a pediatric Trachlight™ (Trachlight, Laerdal Medical, Armonk, NY) was loaded with the same ETT,

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DOI:
10.4103/0970-9185.98340

for light-guided nasal intubation. The stylet was gently bent to an angle of 90°, at a distance from the tip approximately conforming to the distance between the tragus and the thyroid cartilage. The loaded Trachlight™ was inserted through the more patent nostril and pushed straight down to the distance between the nares and the tragus (corresponding to the posterior pharyngeal wall) and then rotated anteriorly. Almost immediately, a bright glow was observed above the thyroid cartilage prominence. The rigid stylet was retracted and the ETT was slid into the trachea and confirmed by capnography. The whole procedure could be accomplished within 30 s and there was no desaturation. After securing the ETT, the surgery proceeded uneventfully. The balance operative period was unremarkable. The child was observed for the next few days for any airway related complications before being discharged home.

Discussion

Surgical repair of maxillofacial trauma requires nasal intubation most of the times. It can be accomplished in various ways namely direct laryngoscopy, blind nasal intubation, flexible fiberoptic bronchoscopy (FFB), lighted stylet and retrograde intubation amongst others. Most anesthesiologists are comfortable with direct laryngoscope guided nasal intubation in the presence of adequate mouth opening. FFB-guided intubation is considered the gold standard for managing difficult airway, but has limitations in difficult pediatric airway, as FFB of smaller sizes are not available in every institute. The pediatric FFB is thinner and its use may result in difficulty in passing an ETT over the FFB into the trachea because of two reasons: first, the ETT may get caught on the epiglottis, arytenoids folds, or corniculate cartilages,^[1,2] and second, a thin FFB is more pliable than its adult counterpart and may bend at the laryngeal aperture. The FFB may thus flip out of the trachea and be forced into the esophagus when the ETT is advanced. Retrograde intubation is not an easy procedure in a small child, as landmarks are not easily identifiable.^[3,4]

In the patient described, difficult airway was recognized only after administering the neuromuscular blocking agents. As the appropriate-sized FFB for infants was not available, this difficult airway was dealt with the Trachlight™. Lightwand-guided intubation is a simple technique in which an illuminated stylet is introduced into the ETT and the tip of the tube is directed into the trachea guided by transillumination of neck tissue.^[5] The Trachlight™ is a modification of the Lightwand, which was in use earlier. Since the introduction of the Lightwand by Yamamura in 1959, several intubation devices based on transillumination have been developed.^[6] The Trachlight™ was introduced by Hung in 1995 and its use is easier as compared to previous devices.^[7] It is not much affected by secretions or

blood and can be cleaned and sterilized readily. It can be easily transported to remote settings. Although there are several reports on its efficacy in difficult airway,^[8-11] there is limited literature on its use in children. Xue *et al.*, reported four cases posted for ear reconstruction in which laryngoscope-guided intubation could not be done due to craniofacial abnormalities. They managed all the cases with Trachlight™ guided orotracheal intubation.^[12] Quentin *et al.*, studied 125 children under the age of 10 years and they found that the Trachlight™ can be used successfully even by novice users.^[13] In small children, transillumination of the soft tissues of the anterior neck is superior to that in adults and a relatively bright glow on the anterior neck may appear like a tracheal glow even in esophageal placement, particularly in infants. The Trachlight™ should not be forced against any resistance and is not appropriate when intrinsic laryngeal abnormalities are present, or when neck anatomy precludes transillumination.

In conclusion, Trachlight™ guided nasotracheal intubation may be an alternative and aid to secure airway in small children. The much lower cost^[14,15] of the device as compared to the FFB makes it a lucrative choice in most circumstances.

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How to cite this article: Jain A, Naithani M. Infant with unanticipated difficult airway - Trachlight TM to the rescue. *J Anaesthesiol Clin Pharmacol* 2012;28:361-3.

Source of Support: Nil, **Conflict of Interest:** None declared.

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