INSTRUMENT FAILURE LED TO BLIND NASAL INTUBATION IN CLOSED MOUTH PATIENT

*Karim Nasseri1 and Shoaleh Shami2

1Department of Anesthesia and Intensive Care, Besat Hospital Clinical Study Center (BHCSC), Kurdistan University of Medical Sciences, Sanandaj, Iran
2Department of Nursing, School of Nursing and Midwifery, Kurdistan University of Medical Sciences, Sanandaj, Iran

*Author for Correspondence

ABSTRACT
Airway management in the presence of closed mouth is challenging for anesthesiologists. Nasotracheal route is the only way for intubation in such situations. Routinely nasal intubation will be done under fibreoptic bronchoscope or light-aiding devices guidance. In the failure of such devices it could be done blindly. Here we report a closed mouth patient scheduled for pedicle division in second stage of Abbe Flap planed for nasal intubation under fibreoptic bronchoscope guidance. We encountered with unwanted instrument failure that lead to change in anesthesia plan using inhalation induction and blind nasal intubation. Thereby we highlighting the fact that blind nasal intubation is a forgotten art in modern education that could be helpful in management of airway in the absence of fibreoptic bronchoscope or light-aiding devices.

Keywords: Blind Nasal Intubation, Fibreoptic Bronchoscope, Airway Management

INTRODUCTION
Owing to rapid technological advancements and supply of new instruments, helpful in airway management, such as fibreoptic bronchoscope (FOB) and light-aiding devices, blind nasal intubation (BNI) have fallen out of favor (Kriet et al., 1995). However, it is a valuable technique in airway management in the absence of access to high-tech tools along with lack of skill and experience to use those (Zhang et al., 2014). Despite all of these reasons, due to unpredictable events, familiarity with this method and teaching this skill to anesthesia professionals can be helpful and life-saving for the patients. Here we discuss the value of this technique with reporting a case.

CASES
A thirteen-year-old boy with congenital cleft lip was selected as the candidate for two-stage restoration of upper lip through Abbe Flap. In the first phase, nasal intubation was carried out under general anesthesia through direct laryngoscopy using nasotracheal tube (ID=6), and the patient’s cleft lip was filled with pedicled composite skin-muscle-mucosa flap from the lower chin to maintain the neurovascular base. The patients’ lips were attached in this stage, with no possibility to open the mouth. The operation was successfully done and the patient was extubated while he was conscious. Three weeks later, the patient was a candidate for anesthesia for cutting the flap and final restoration of lip. General anesthesia was planed using intravenous anesthetic, muscle relaxant and nasal intubation via FOB technique. In the day of operation, an unexpected event occurred, and it was swelling and increasing diameter of distal area of the only fibreoptic bronchoscope in our center (due to use of non-standard solution for disinfection and poor preservation), so that it was not possible to insert it into endotracheal tube smaller than Id=7(Figure 1). Therefore, we changed the anesthesia plan and decided to perform BNI after inhalational induction of anesthesia with sevoflurane. After premedication with atropine, we used phenylephrine drop for nasal vasoconstriction, and then standard monitoring’s including: ECG, pulse oximetry and noninvasive blood pressure were attached. Then inhalation induction of anesthesia was started using 100% oxygen and 4% sevoflurane and the concentration of sevoflurane were gradually increased to 8%.
Case Report

Figure 1: Fibreoptic bronchoscope with swelled distal area fitted the lumen of endotracheal tube

Figure 2: Blindly nasal intubated patient with closed mouth

The surgeon was ready for emergency intervention if intubation failed or the patient life was at risk. When the pupils were miotic and centered, nasal tube size 6 was lubricated and gently inserted into oral cavity through the right nostril of the patient under the guidance of the patient's spontaneous breathing sounds. The first attempt for intubation failed and endotracheal tube was extracted from the nose with a lumen filled with blood, and the patient’s mouth was suctioned through the holes in the side of the patient's mouth and a suction catheter was left here for prevention of aspiration. Following re-oxygenation and re-deepening of anesthesia with inhalation of sevoflurane, a new endotracheal tube was inserted into the patient’s oral cavity the same as the previous method, however in new attempt we connect the tube to anesthesia circuit and sampling tube connected to a capnometer to monitor the end-tidal CO₂, as the guide of directing and advancing the endotracheal tube. After several backward, right and lateral manipulations.
Case Report

and pressure on glottis, the tube was inserted and patient started coughing and straining against the tube. Having ensured the correct position of the tube by capnometry waves and clinical methods, endotracheal tube was fixed (Figure 2).

The depth of anesthesia was increased by intravenous propofol and fentanyl, and cisatracurium was injected to facilitate ventilation. Lip restoration in the second phase took 75 minutes and the patient was finally extubated (Figure 3).

DISCUSSION

In the practice and in the presence of a closed mouth when we noticed that there is an unexpected failure of high-tech airway toys such as FOB, there is two choices. First, canceling the elective surgery and waiting for solving the problem, and second, changing the plan to a safe alternative method. We chose the second way. However we have to warranty the safety of method.

For elevation of safety we did not used intravenous hypnotics, opioids, or muscle relaxant agents, and induction of anesthesia were done with sevoflurane.

Sevoflurane, a volatile anesthetic agent, is halogenated ether. Because of low blood: gas partition (blood: gas partition coefficient of 0.65 and fat: blood solubility 48 at 37°C) It has a rapid induction time (Gupta et al., 2004). Based on study results the mean time to reach the clinical end-point for intubation with sevoflurane is 243 second (O’Brien et al., 1998). Sevoflurane also has a quick emergence time. So it’s time from cessation of the inhalation agent to opening of the eyes takes 429 second (Karlsen et al., 2000). Woods suggested that, when there is a limitation to use neuromuscular blocking agents sevoflurane is best inhaled anesthetic for tracheal intubation (Woods et al., 2005).

Nasotracheal intubation may be performed in patients undergoing maxillofacial surgery, dental procedures, or in patients with limited mouth opening when orotracheal intubation is not feasible (Hall et al., 2003). Routinely advancement of Inserted nasal tube will be done by laryngoscope under direct vision. In the presence of closed mouth direct laryngoscopy is impossible, and the only safe and noninvasive way to secure airway is to place a nasotracheal tube by other means. Nowadays, it is done under guidance of FOB or new other high-tech airway instruments. However in the past BNI was the preferred technique for airway control before FOB and muscle relaxant drugs were presented (Nofal et al., 2010). Currently, BNI procedure is required in the case of lack of access to oral tract, mandibular or maxillary bone fractures and poor mouth opening and lack of possibility to use FOB (due to inaccessibility, lack of experience, and presence of blood and copious secretions in the oral cavity) (Gupta et al., 2010).
Case Report

et al., 2004). Although, BNI have fallen out of favors, and tends to be reserved for situations in which direct laryngoscopy is impossible or where induction of general anesthesia before neuromuscular blockade would be hazardous (Hall et al., 2003). However, this technique remains as a safe method for management of difficult airway in remote areas where a FOB is not available (Dong et al., 2013). The best time for using BNI method is when the patient remains conscious and light-aided tools are not available (Hall et al., 2003). The principal determinant of BNI success is the users’ expertise (Kriet et al., 1995). The major advantage of this technique is the ease and the success rate in the first attempt is about 60-70% (de Carli et al., 2008). Thus, we believe that teaching this technique via workshops or instructional curricula in regions with less access to new tools is cost-effective and helpful and should be continued to use in daily practice.

Ethical considerations: Informed consent was taken from the patients’ parents to publish the photographs.

REFERENCES