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BLIND NASAL INTUBATION REVISITED: NO LONGER A BLIND TECHNIQUE?

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□ **Abstract—Background: Advancements in airway management have made the practice of blind nasal intubation obsolete. We report on successful blind nasal intubation performed with the help of capnography and real-time ultrasonography in two patients with tempormandibular joint ankylosis. Case Report: Blind nasal intubation was performed in a 12-year-old patient and a 17-year old patient under general anesthesia with spontaneous respiration. Capnography was used as an aid during insertion and dynamic ultrasonography was performed to guide and confirm proper tracheal tube placement.**

Use of capnography helps in following the correct path toward the glottic opening, with quick detection of any obstruction, and with confirmation of final placement of the tracheal tube. Ultrasonography aids with entry into the glottis and with identifying the correct placement.

We recommend the use of this modified blind nasal intubation in patients with limited mouth opening when equipment, such as a fiberoptic scope, is not available or is nonfunctional in the emergency department. Why Should an Emergency Physician Be Aware of This?: Adapting this technique will add to the armamentarium available for airway management in emergency medicine, particularly in maxillofacial injuries with limited mouth opening.

□ **Keywords—intubation; blind nasal; capnography; ultrasonography**

INTRODUCTION

Blind nasal intubation (BNI) was a valuable rescue tool in conditions with limited mouth opening, such as tempormandibular joint ankylosis or maxillofacial surgery, where laryngoscopy and orotracheal intubation are extremely difficult. Advances in airway equipment and management have relegated this technique to the pages of history. A recent editorial did not find any evidence to advocate this somewhat antiquated technique, even for low- or middle-income countries, or to recommend its reintroduction into modern airway management (1).

However, despite the available airway management techniques, many are of the opinion that BNI is a life-saving alternative in difficult airway management, particularly in a resource-poor environment (2,3).

We present two successful cases of BNI in patients with ankylosis of temporomandibular joint aided with capnography and ultrasonography (US) dynamically, which served as two technological eyes to the so-called "blind procedure."

CASE REPORT

Case 1

A 12-year-old, 38-kg body weight male patient was scheduled for surgical release of ankylosis of left

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temporomandibular joint. The patient was barely able to open his mouth (Figure 1). Apart from facial asymmetry, the physical examination was unremarkable. Routine blood tests were within normal limits. Computed tomography (CT) scan showed gross deformity of the left condyle and coronoid process, along with hypertrophic changes with fibrous ankylosis of the left temporomandibular joint, leading to facial deformity on the left side.

Case 2

A 17-year-old, 43-kg body weight male patient was scheduled for surgical release of ankylosis of right temporomandibular joint. The patient was unable to open his mouth more than 1 cm (Figure 1). Except for facial asymmetry, the physical examination was unremarkable and hematologic investigations were within normal limits. CT scan showed complete bony ankylosis of the right temporomandibular joint with osseous hypertrophic changes resulting in facial asymmetry.

Intubation Methodology

BNI under general anesthesia was planned for both patients. Lateral view of the neck was obtained with CT scan or x-ray study to rule out any obvious pathology, such as presence of adenoid, that might obstruct the path of the tracheal tube (TT).

After evaluation of both the nostrils by performing anterior rhinoscopy, xylometazoline 0.1% was instilled 10 min before induction of anesthesia. Meanwhile, routine monitoring in the form of electrocardiography, noninvasive blood pressure (NIBP), and pulse oximetry were instituted and i.v. access was established with 18G cannula. A 9-MHz linear US transducer (Nemio SSA-550A; Toshiba Medical Systems Corporation, Tochigi-Ken, Japan) was used in the transverse plane over thyroid cartilage and the structures in the neck were identified. The patient was asked to make the sound of "ee-ee" to help visualize the location of the vocal cords (Figure 2). Esophagus was visualized posterolateral to the trachea after asking the patient to swallow, which resulted in visible peristaltic movement of the esophageal lumen (Figure 2). Skin over both structures was marked with an "X" to facilitate later sonography (Figure 2, inset). General anesthesia was induced with fentanyl 2 μ/kg and propofol 2 mg/kg and was maintained with 2%–4% sevoflurane and 50% nitrous oxide in oxygen through spontaneous ventilation. Small titrated doses of propofol were administered whenever required.

The right-handed anesthesiologist stood on the left side of the head end of the operating table. The patient monitor and an US equipment were kept on the right lower side of the operating table so that the anesthesiologist was able to look at both monitors simultaneously without much strain.

The patients were placed supine with their head extended and neck flexed in the sniffing position. A side stream capnograph was attached to a 7.5-mm inside diameter TT. The US transducer was put on the mark on the neck with the left hand of the clinician and the movement of the vocal cords during spontaneous ventilation

Figure 1. Showing limited mouth opening in the patients.