Hôpital Militaire d'Instruction Mohammed V Rabat,
Rabat, Maroc, Afrique
Courriel : lbelyamani@hotmail.com
Accepté pour publication le 28 novembre 2007.

Références

1 *Liu H, Jahr JS, Sullivan E, Waters PF.* Tracheobronchial rupture after double-lumen endotracheal intubation. J Cardiothorac Vasc Anesth 2004; 18: 228–33.
2 *Hofmann HS, Rettig G, Radke J, Neef H, Silber RE.* Iatrogenic ruptures of the tracheobronchial tree. Eur J Cardiothorac Surg 2002; 21: 649–52.
3 *Kaloud H, Smolle-Juettner FM, Prause G, List WF.* Iatrogenic ruptures of the tracheobronchial tree. Chest 1997; 112: 774–8.
4 *Brichet A, Ramon P, Marquette CH.* Sténoses et complications trachéales postintubation. Réanimation 2002; 11: 49–58.

Patient-controlled oral airway insertion to facilitate awake fibreoptic intubation

FIGURE The local anesthetic (arrows) is applied to the distal end of the oral intubating airway (Berman, Vital Signs, Totowa, NJ, USA) for effective 'patient-controlled' airway insertion and anesthetic application to the patient's airway. The patient appeared relaxed while he inserted the oral airway (A). This procedure was completed within one minute. The awake, fibreoptic intubation (B) was successful, expedient and tolerated well.

To the Editor:
The main challenge during flexible, fibreoptic, endotracheal intubation is the considerable discomfort and associated gagging that occurs whenever airway topicalization is either difficult or incomplete. Different techniques, including those utilizing Berman intubating airways (Vital Signs, Totowa, NJ, USA), have been developed to enhance upper airway anesthesia. Despite such advances, topicalization of the airway can be a challenging and time consuming procedure. Recently we employed a "patient-controlled" technique using a lidocaine-coated Berman airway to facilitate a distress-free fibreoptic intubation in a patient with a known difficult airway.

The patient, an obese (111 kg), 46-yr-old male scheduled for a repeat hip arthroplasty, experienced difficulties with airway management, after induction of anesthesia for hip debridement two weeks prior. He required a laryngeal mask airway as a temporizing measure following multiple attempts at tracheal intubation by direct laryngoscopy. His surgery was cancelled due to difficulties associated with bag-mask ventilation and a suspicion of aspiration. Three days later, we scheduled a hip debridement and planned an awake, fibreoptic intubation. We administered midazolam 4 mg *iv* and glycopyrrolate 0.3 mg *iv* in the operating room; and we achieved topicalization using nebulized 4% lidocaine (4 mL). An oral bite block was used to aid bronchoscope insertion. Nevertheless, despite a reported lack of history of sensitivity to gagging, the patient was reported to have complained of discomfort from gagging and he also experienced profound coughing fits.

At the time of presentation, examination of the patient's airway revealed a Mallampati grade 3, a full set of teeth, and reduced neck extension. The anesthetic plan focused on attempting fibreoptic intubation through an intubating airway to ensure adequate topicalization. Routine monitors were applied and an 18G *iv* was established. The patient received glycopyrrolate 0.25 mg *iv*, but, at this point, no intravenous sedation was administered. We explained the planned, oral airway insertion technique to the patient and obtained his consent. To begin with, the patient received two sprays of 2% lidocaine to anesthetize his mouth and oropharynx, then a thin layer of 5% lidocaine ointment (12 mL) was applied to the distal portion of the oral airway (Figure, Panel A) which was then progressively and slowly advanced. Within one minute, the patient was easily capable of completely inserting the airway without gagging. Next, 1 mL of 4% lidocaine was atomized via the airway, and the vocal cords were visualized immediately upon advancement of the fibreoptic scope. Four millilitres of 4% lidocaine were then injected through the suction port of the bronchoscope, both above and below the vocal cords. The patient tolerated the procedure well, while maintaining spontaneous respiration and he did not cough or experience oxygen desaturation. Anesthesia was intravenously induced after the tracheal intubation and the patient remained stable throughout the three-hour operation. Tracheal extubation took place when the patient was fully awake at the end of procedure.

The gag reflex is often stimulated during awake, fibreoptic intubation and accounts for much of the procedural discomfort. Activation of the glossopharyngeal nerve results in spasmodic and uncoordinated muscle movements.[1] Physical stimuli may induce gagging in some patients, while psychological stimuli (e.g., anxiety) may induce gagging in others. Techniques to reduce gagging include relaxation, hypnotherapy, acupuncture and "hypnopuncture", all of which target the neural pathways between the gagging centre and cerebral cortex.[2–4] Accordingly, patient-controlled airway insertion, in contrast to physician-assisted insertion, may be an easy and reliable method to reduce gagging in this population. By allowing patients to self-insert the oral airway, they are provided the ability to control the rate of entry, and to control the situation whenever they feel they are about to gag. The lidocaine coating of the airway provides additional topicalization, as the airway directly contacts the oropharynx tissue during the procedure.

Patients with a known difficult airway may benefit from fibreoptic intubation using oral intubating airways. Providing clear instructions for "patient-controlled" insertion may improve the patient's comfort level and the overall procedural efficiency.

Ban C.H. Tsui MD FRCP(C)
Derek Dillane MB MMedSci FFARCSI
May-Sann Yee MD
University of Alberta Hospital, Edmonton, Canada
E-mail: btsui@ualberta.ca
Accepted for publication December 6, 2007.

References

1 *Finucane BT, Santora AH.* Principles of Airway Management, 3rd ed. New York: Springer-Verlag; 2003: 79–112, 215–33.

2 *Bassi GS, Humphris GM, Longman LP.* The etiology and management of gagging: a review of the literature. J Prosthet Dent 2004; 91: 459–67.

3 *Fiske J, Dickinson C.* The role of acupuncture in controlling the gagging reflex using a review of ten cases. Br Dent J 2001; 190: 611–3.

4 *Eitner S, Wichmann M, Holst S.* "Hypnopuncture"- A dental-emergency treatment concept for patients with a distinctive gag reflex. Int J Clin Exp Hypn 2005; 53: 60–73.

Combined use of ultrasound and nerve stimulation for phrenic nerve block

To the Editor:

We previously reported that nerve stimulation may be used to facilitate phrenic nerve block to treat hiccups.[1] However, we recognize that it may be difficult to locate the phrenic nerve, as it is a relatively thin nerve which transverses a small space between the sternocleidomastoid and the scalenus anterior muscles. Whereas ultrasound localization has been shown to be effective in identifying the brachial plexus and the femoral and sciatic nerves, its sensitivity in locating finer nerves has not been established.[2] We recently used ultrasound, in combination with nerve stimulation, to locate and block the phrenic nerve of a 60-yr-old male (weight 74 kg, height 160 cm) who was referred to our department for treatment of chronic hiccups.

In this case, fluoroscopy showed that hiccups were associated with contractions of both hemidiaphragms. To locate the left phrenic nerve, we inserted the 100-mm 21G needle tip (Stimuplex; B.Braun, Melsungen, Germany) underneath the sternocleidomastoid muscle, while we applied an electric current (1.5 mA; 2-Hz) using an electric nerve stimulator (InnerveTOR272®, Fisher & Paykel, Auckland, New Zealand). We failed to obtain diaphragmatic responses, probably because the patient had a thick neck. We then attempted to locate the phrenic nerve using ultrasound (MicroMAX; Sonosite, Tokyo, Japan). Although we were able to identify the space between the sternocleidomastoid and the scalenus anterior muscles, the phrenic nerve was difficult to identify. Therefore, we used the nerve stimulator in combination with ultrasound localization. With the ultrasound probe directed in the axial oblique plane, at the level of the C-7 vertebra (Figure), we introduced the 100-mm 21G needle tip in-line (longitudinally) with the ultrasound probe; and we confirmed correct placement of the needle tip, in the space between the sternocleidomastoid and the anterior scalenus muscles. While we applied an electric current (0.8 mA; 2-Hz) to the needle, we adjusted the position of the needle tip within the space. It was then possible to obtain diaphragmatic contractions. As the contractions readily synchronized with the stimulation frequency, it was easy to differentiate stimulation-induced diaphragmatic contractions from hiccups. We