Awake insertion of the air-Q™ intubating laryngeal airway device that facilitates safer tracheal intubation in morbidly obese patients

Editor—Morbidly obese patients are at a higher risk of difficulties with mask ventilation and tracheal intubation. The difficult airway management algorithm recommends awake intubation in patients anticipated to have difficult airways. Recently, supraglottic airway devices have been established as important tools for difficult airway management. We present an observational study of airway management in obese patients by performing awake insertion with air-Q™ intubating laryngeal mask airway (ILMA) devices (Mercury Medical, USA) and subsequent tracheal intubation.

Twenty morbidly obese patients undergoing bariatric surgery with any three of the following risk factors for difficult airway management were included: Mallampati class III or IV, neck circumference > 40 cm, thyromental distance < 6 cm, cervical mobility limitation, mouth opening limitation, receding mandible, missing teeth, beard, and history of snoring. Patients were placed in the recommended ramp position and after 3 min of preoxygenation with 100% O₂, i.v. midazolam (20–40 μg kg⁻¹) and fentanyl (1–2 μg kg⁻¹) were administered to achieve light sedation (Fig. 1a). Patients were asked to open their mouth, and size 3.5 air-Q™ ILMA devices were inserted. The cuffs were inflated with air to 15 ml after insertion in all patients. After confirming a secure airway by sufficient spontaneous respiration (tidal volume (TV) > 5 ml kg⁻¹ ideal body weight (IBW)), general anaesthesia (propofol 2 mg kg⁻¹ IBW, fentanyl 0.1 mg, and rocuronium 0.6 mg kg⁻¹ IBW) was induced and mechanical ventilation was initiated. When sufficient mechanical ventilation was confirmed by TV > 5 ml kg⁻¹ IBW, the tracheal tube (Parker Flex-Tip™ 7.0 mm) was inserted under fibroscopic visualization using the air-Q™ as a conduit. Removal of the air-Q™ after tracheal intubation was facilitated by removal stylet (Fig. 1a), which stabilized the tracheal tube. End-tidal carbon dioxide tracings were monitored to detect dislodgement of the tracheal tube.

The patients’ BMI was 35–53 (mean 45.3 (9.2)) kg m⁻² and age was 34–54 (mean 43.2 (8.8)) yr. The procedure was performed without difficulty in all patients except one whose vocal cords were not visible. Nine patients had minimal air leakage during mechanical ventilation but showed sufficient

---

**Fig 1** (a) Awake insertion of the air-Q™. (b) Fibreoptic, removal stylet, and tracheal tube. (c) Size 3.5 air-Q™ ILMA.
Respiration, and no patient experienced oxygen desaturation to <92%. Adequate light sedation before awake insertion of the ILMA was achieved with total midazolam and fentanyl doses ranging from 3 to 6 (mean 4.4 (0.8)) and 0.1 to 0.3 (mean 0.16 (0.6)) mg, respectively. No patient recalled experiencing discomfort during the procedure when questioned after operation.

We obtained good results with awake insertion of a size 3.5 air-Q® ILMA device followed by tracheal intubation using the device as a conduit in morbidly obese patients (n=20) undergoing bariatric surgery. This ILMA device is designed for easier insertion. It has a curvature approximate to that of the upper oropharyngeal airway and a wider (anterior–posterior diameter=15 mm) and shorter airway conduit than previous models. It has an easily removable airway adapter with no grill in the ventilating orifice, which may further facilitate insertion and placement (Fig. 1c).

In conclusion, the technique we describe may be a viable alternative to mask ventilation and direct laryngoscopy for safe airway management in morbidly obese patients. Further studies and detailed comparison with results of other techniques may be warranted.

Declaration of interest
None declared.

T. Shiraishi*
Tokyo, Japan
*E-mail: shiraishi@mcube.jp


doi:10.1093/bja/aet389

Bradycardia after dexamethasone for postoperative nausea and vomiting prophylaxis during induction of anaesthesia

Editor—we report a case of sinus bradycardia after a single dose of i.v. dexamethasone for postoperative nausea and vomiting (PONV) prophylaxis during anaesthesia induction.

A 51-year-old woman, ASA II, undergoing elective spine surgery due to a protruding intervertebral disc was brought to the anaesthesia induction room. She had mild arterial hypertension and non-active rheumatoid arthritis for which she received no therapy. She reported allergies to nickel and formaldehyde. Her BMI was 35 and she was a non-smoker with a history of PONV after discectomy in the past. Monitoring of the patient included ECG, non-invasive arterial pressure, and pulse oximetry. Her vital signs were: heart rate 80–85 beats min⁻¹, arterial pressure 170/90 mm Hg, SaO₂ 95% on breathing room air. An i.v. line was inserted and infusion with Ringer’s lactate 500 ml was initiated.

Owing to the high risk of PONV, a prophylactic dose of i.v. dexamethasone 4 mg was given at anaesthesia induction. One minute later, the patient’s heart rate decreased to 40 beats min⁻¹ and she felt drowsy. No dose of benzodiazepine or opioid had been given at this point. I.V. atropine 0.5 mg resulted in no change in heart rate. A second dose of i.v. atropine 0.5 mg was given 5 min later. The heart rate slowly increased to 80–85 beats min⁻¹. Anaesthesia was induced with i.v. fentanyl 0.15 mg, propofol 2 mg kg⁻¹, and rocuronium 0.6 mg kg⁻¹ and the trachea was intubated. Anaesthesia was maintained with a combination of the volatile anaesthetic sevoflurane and intermittent doses of i.v. fentanyl 0.05–0.1 mg. No clinically relevant changes in heart rate or arterial pressure beyond the 20% range of the initial values were observed. The course of anaesthesia, operation, and the following recovery were uneventful. Echocardiography examination on the first postoperative day showed no cardiac abnormality. The patient was discharged in good general condition.

The present report might be the first case to draw attention to potentially serious side-effects of a single-dose of i.v. dexamethasone. Dexamethasone has been routinely used for prophylaxis and treatment of PONV and the quantitative systematic review of Henzi and colleagues showed that a single application did not seem to provoke any of the known side-effects of corticoids. These include cardiac arrhythmias and even sudden death. The authors of the cited review point out, however, that they ‘still do not know if a single bolus dose of dexamethasone 8 or 10 mg is safe in patients at risk of corticosteroid-related adverse effects’.

As described in the literature, most of the patients experiencing complications after i.v. application of glucocorticoids were either adults with autoimmune and rheumatic diseases or premature infants. Our patient had a history of rheumatoid disease. Furthermore, some authors suggest that high-dose methylprednisolone may be contraindicated in patients with known heart disease. There are no data confirming whether this suggestion relates to the use of dexamethasone.

The preservatives used in the drug preparation might also be a contributing factor. Our patient reported allergic reaction to formaldehyde. Although cross-reactivity between formaldehyde and preservative substances cannot be excluded, our patient showed no symptoms of anaphylactic reaction.

Undoubtedly, serious side-effects of dexamethasone are rare. Our case shows, however, that the possibility of serious side-effects after a low dose of dexamethasone still exists and that these side-effects can occur in the anaesthetic practice. Avoiding rapid bolus application in patients with known risk factors and continuous monitoring can help with timely recognition and treatment of the adverse cardiovascular side-effects that may follow after i.v. application of dexamethasone.
Awake bronchoscopic intubation through an air-Q® with the application of BIPAP

David T. Wong, MD · Jane Wang, MD · Lashmi Venkatraghavan, MD

Received: 1 April 2012 / Accepted: 24 May 2012 / Published online: 22 June 2012
© Canadian Anesthesiologists’ Society 2012

To the Editor,

Awake tracheal intubation is recommended for patients with a known or suspected difficult airway. A supraglottic airway device has been used as a conduit for awake intubation with a flexible bronchoscope.¹ We describe an awake bronchoscope-guided tracheal intubation through an air-Q® intubating laryngeal airway (air-Q®, Mercury Medical, Clearwater, FL, USA) with continuous application of bilevel positive airway pressure (BIPAP) in a patient with a difficult airway and respiratory failure. Written consent was obtained from the patient for the publication of this article.

A 46-yr-old, 146-kg man with severe obstructive sleep apnea and obesity hypoventilation syndrome was admitted to the intensive care unit (ICU) for acute respiratory failure. Six months prior, an emergency cricothyroidotomy was performed after a prolonged awake fiberoptic tracheal intubation failed due to rapid oxygen desaturation and repeated closure of false vocal cords during intubation. In this case, a decision was made to perform an urgent tracheostomy as previous tracheal intubation attempts had failed. An awake tracheostomy was likely difficult due to our patient’s anatomy, intolerance of supine positioning, and respiratory failure. Therefore, we planned to perform an awake tracheal intubation followed by induction of anesthesia and tracheostomy in the operating room (OR).

The patient was transferred from the ICU to the OR on BIPAP (25/12 cm H₂O), his oxygen saturation was 94% with an inspired oxygen fraction (F₉O₂) of 1.0, and the surgeons were prepared with their tracheostomy equipment. Standard monitors were applied, and following intravenous sedation, 4% topical lidocaine was atomized nasally and orally. During topicalization, BIPAP was reapplied repeatedly because of oxygen desaturation. The oral insertion of a size 4.5 single-use air-Q in the sitting position was well tolerated, and BIPAP was applied to the air-Q (Figure, top), followed by the insertion of a 6.5-mm endotracheal tube (ETT) via the air-Q to 14 cm. The ETT cuff was inflated, and BIPAP was connected to the ETT through a flexible connector with a bronchoscope port (Figure, bottom). A bronchoscope (outside diameter 5.2 mm) was advanced through the flexible connector past the well-visualized glottis to the carina. The ETT cuff was deflated and advanced over the bronchoscope into the trachea. After re-inflation of the ETT cuff and confirmation of tracheal positioning of the ETT with the bronchoscope, a general anesthetic was administered, and the ETT/air-Q unit was taped to the patient’s face. An oxygen saturation > 97% was maintained during the intubation process. A tracheostomy was performed uneventfully.

Bilevel positive airway pressure is used frequently in patients with respiratory failure or obstructive sleep apnea.² In this case, it appears that continuous BIPAP through the air-Q was better tolerated by our patient than intermittent BIPAP via a tightly strapped facemask, and oxygenation was improved during tracheal intubation. The role of BIPAP is to improve functional residual capacity, reduce atelectasis, and prevent hypoxemia. The splinting effect of positive ventilatory pressures also prevents the collapse of upper airway structures during spontaneous breathing. By stenting open the upper airway, BIPAP may have improved our visualization of the vocal cords. Alternative techniques of awake intubation have been described with devices such as videolaryngoscopes, rigid fiberoptic laryngoscopes, and fiberoptic/lighted stylets; however, none of these

D. T. Wong, MD (✉) · J. Wang, MD · L. Venkatraghavan, MD
Toronto Western Hospital, University of Toronto, Toronto, ON, Canada
e-mail: david.wong@uhn.on.ca
Awake insertion of a supraglottic airway followed by fibreoptic-guided tracheal intubation has been described in patients with morbid obesity and a difficult airway\textsuperscript{34}; however, in both cases, a general anesthetic was administered prior to ETT insertion and BIPAP was not used. Our technique, which allows the maintenance of BIPAP through the ETT and air-Q during intubation, can be employed using any supraglottic airway that allows the passage of a large ETT (e.g., LMA Fastrach\textsuperscript{TM}, i-gel\textsuperscript{®}, Ambu\textsuperscript{®} AuraOnce\textsuperscript{TM}). We chose the air-Q because it was immediately available.

In summary, we describe the novel application of nearly continuous BIPAP during an awake bronchoscope-guided intubation through the air-Q. This technique may be useful in performing awake tracheal intubation in patients with difficult airways who have respiratory failure or collapsible upper airway structures.

\textbf{Funding sources} Study supported, in part, by the Department of Anesthesia, Toronto Western Hospital, University of Toronto.

\textbf{Competing interests} None declared.

\section*{References}