paralysis and mechanical ventilation ensued without cardiac or respiratory compromise. However, on sternotomy incision, the infant experienced sudden treatable ventricular fibrillation, likely a result of his tenuous cardiac status. Complete repair of the total anomalous pulmonary venous return occurred. He was extubated on postoperative day three, and subsequent chest films showed significantly improved tracheal alignment. Further delineation of other possible causes of tracheal deviation were not worked up due to the urgent need for surgery.

Infants with cardiac defects also may have undiagnosed airway anomalies. These may be intrinsic anomalies such as tracheal stenosis or, as in our case, tracheal deviation secondary to massive cardiomegaly. When considering induction of anesthesia in a patient in whom tracheal compression and obstruction are possible, it is important to have all necessary equipment in the room (Laryngeal Mask Airway, rigid bronchoscope), and an ENT and cardiac surgeon available in case conversion to extracorporeal membrane oxygenation or cardiopulmonary bypass is necessary.

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References


Facilitating GlideScope intubation with the straight end of an endotracheal tube introducer

To the Editor:

During airway management with the GlideScope videolaryngoscope (Verathon, Inc., Bothell, WA, USA), successful endotracheal intubation may require more than one attempt in spite of a good glottic view [1]. To facilitate intubation with GlideScope videolaryngoscopy, an Eschmann gum bougie [2], a modified Eschmann guide [3], or an endotracheal tube (ETT) introducer [4] may be passed through the vocal cords, allowing the ETT to be advanced. Endotracheal tube introducers are typically employed with the coudé tip directed to the glottic inlet. While the anteriorly angulated tip of the introducer is helpful in many situations, we describe a case in which the straight end of an ETT introducer was more effective in assisting intubation with the GlideScope.

An elderly man with hypertension, diabetes, atrial fibrillation, mechanical mitral valve, and moderate pulmonary hypertension presented for dental extractions during general anesthesia. Preoperative airway examination showed Mallampati class 4 opening and normal range of motion of the neck. After induction of anesthesia and confirmation of easy mask ventilation, GlideScope videolaryngoscopy provided a grade I view. However, a styletted, curved ETT could not be directed to the glottis. After further ventilation of the patient, videolaryngoscopy was repeated and a Sunmed ETT introducer (Azimuth Corp., Largo, FL, USA) shaped in a “C” curve was placed in the oropharynx; the distal coudé tip was maneuvered to the glottic opening. The introducer could not be advanced beyond the glottis, as the distal angulated portion remained parallel to the glottic axis, contacting the anterior commissure. Therefore, the direction of the ETT introducer was reversed and a “C” curve was again obtained. With this configuration, the straight end of the introducer passed easily about 3 cm beyond the glottis, a 7.5 oral Ring-Adair-Elwyn (RAE) ETT was advanced into the trachea, after which the ETT introducer was easily removed.

When laryngeal view with the GlideScope is favorable but maneuvering the ETT into the airway is unsuccessful, an ETT introducer is often employed. It is malleable and easy to advance or withdraw even in patients with limited oropharyngeal volume. The small diameter of the introducer makes it easy to rotate between the operator’s fingers to facilitate proper placement. Typically, the end of the introducer with the coudé tip is utilized for ETT placement, with most operators having higher rates of successful intubations with this method than with the “straight” end of the introducer [5]. However, in some patients the path of the introducer from the incisors to the glottis requires such a degree of curvature that the coudé tip is not optimally aligned to pass beyond the glottis. Application of the straight end of the introducer addresses this problem.

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Thoracic paravertebral block for awake breast surgery in a patient with congenital central hypoventilation syndrome (Ondine’s Curse)

To the Editor:

Congenital central hypoventilation syndrome (Ondine’s curse) is an extremely rare disorder characterized by impaired ventilatory response to both hypercapnia and hypoxemia [1]. Given its low incidence, only case reports are available on which to base the perioperative management of patients with this disorder [2-4]. We report a case of successful ultrasound-guided, thoracic paravertebral block as the sole anesthetic technique in a patient with late onset congenital central hypoventilation syndrome undergoing breast surgery. Approval by the Institutional Review Board of Amphia Hospital, Breda and written, informed consent by the patient to publish this case were obtained.

A 55 year old woman was scheduled for lumpectomy with sentinel lymph node removal of the left breast. Eight months prior to surgery, she was diagnosed with late onset congenital central hypoventilation syndrome based on history and functional tests, including polysomnography and ventilatory response tests to increased CO₂ and decreased O₂ inhalation. A mild PHOX2B mutation was later confirmed by DNA investigation. Other than congenital central hypoventilation syndrome, for which she was receiving oral theophylline and noninvasive bi-level positive airway pressure ventilation at night, our patient was in good health. Anesthetic management was discussed in detail with the patient, and she opted for thoracic paravertebral block as the sole anesthetic technique.

Prior to surgery, the patient was placed prone, the left parasagittal plane was scanned at the T3-T4 level with a 35-mm, high-frequency linear probe and Philips CX50 ultrasound machine (Philips Ultrasound, Bothell, WA, USA). A 100-mm,18-gauge (G) SonoLong Tuohy needle (Pajunk GmbH, Geisingen, Germany) was advanced with ultrasound guidance until the needle tip was positioned immediately posterior to the pleura. After careful aspiration, 20 mL of mepivacaine 1.5% was slowly injected. Identification of the paravertebral space was confirmed by pleural depression [5]. A 20-G SonoLong NanoLine nerve catheter (Pajunk GmbH) was easily advanced 3 cm beyond the needle tip. A 20-G arterial canula was placed in the right radial artery to allow repeat arterial blood gas analysis (ABG). One hour after injection, a band of decreased sensitivity to cold and pinprick developed from the T3 to T8 dermatomes on the blocked side.

Surgery consisted of quadrantectomy of the left breast, followed by oncoplastic intramammary displacement to restore cosmesis and sentinel lymph node removal in the left axilla. During surgery, no sedation, supplemental oxygen, or additional infiltration with local anesthetic was necessary, and vital signs remained stable, with arterial oxygen saturation ranging from 95% to 99%. At the conclusion of surgery, a continuous infusion of levobupivacaine 0.25% was started at a rate of 10 mL/hr. Repeat ABG showed unchanged pCO₂ and pO₂ compared with baseline values (Fig. 1). The patient was pain-free overnight without taking any adjuvant pain medication. After uneventful removal of the paravertebral catheter, she was discharged home the next day.

Given the extremely low incidence of congenital central hypoventilation syndrome, little is known about optimal perioperative management. Case reports have described uneventful general anesthesia in both children and adults, generally stressing the importance of avoiding long-acting drugs known to suppress pulmonary function [2,3]. Regional anesthesia also should be considered where appropriate [2,4]. Thoracic paravertebral block obviated the need for general anesthesia and postoperative systemic opioids.

**Fig. 1** Preoperative and postoperative pO₂ (black boxes; mmHg) and pCO₂ (triangles; mmHg) in a patient with congenital central hypoventilation syndrome undergoing awake breast lumpectomy and sentinel lymph node removal. Thoracic paravertebral block (TPB) was the sole anesthetic technique used. The patient was breathing room air only throughout the entire perioperative period.