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**“Modified Spray-As-You-Go”—a Twist for Intubation**

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**Introduction:**
A 69-year-old female patient came to the emergency room with progressive respiratory distress. She had a history of an asymptomatic neck mass while awaiting definitive histologic diagnosis and treatment. She denied any other personal or family history. The patient reported a feeling of progressive breathlessness, worsening in the last few hours.

**Physical examination:**
Height 160 cm, Weight 65kg, BP 120/80 mm Hg, heart rate 95 beats/minute, respiratory rate 18 breaths/minute, and oxygen (O₂) saturation 94% while breathing ambient air. The physical examination (including the airway and neck motion) was completely normal except for being able to feel a small mass on the right side of the neck, and for noting slight inspiratory retraction in the supraclavicular areas. Auscultation revealed no abnormalities and the presence of conserved good air intake in both pulmonary fields.

**Laboratory studies:**
Initial laboratory studies, including ECG, were normal except for the following: Computed tomography (CT) showed a 7.5 x 5.0 cm space-occupying mass along the right supra-clavicular area, extending to the thoracic outlet, in intimate relation to the right lobe of the thyroid. It appeared heterogeneous, in character, next to the right lateral and posterior wall of the trachea, which was indented. The trachea was narrowed enough to indicate that a tracheotomy was necessary, but sufficiently wide to permit entry of an endotracheal tube (ETT). There was proximal collapse of the esophagus, whose structure returned to its normal caliber at the level of the second thoracic vertebra. After intravenous contrast dye, the mass looked homogeneously solid with some heterogeneous density enhancement (Figure 1).

No predictors of difficulty were anticipated for techniques involving a simple facial mask, supra glottic airway (SGA), direct laryngoscopy, or videolaryngoscopy. However, the patient’s progressive respiratory distress in conjunction with the CT image led us to decide on a conservative approach before the proposed surgery (a definitive tracheotomy).

**Strategy for airway management:**
Our selected plan was to use a GlideScope® videolaryngoscope (GVL—Verathon, Seattle, WA) with a size 3 blade for tracheal intubation, while the patient was awake and ventilating spontaneously.
Plan B was to maintain oxygenation, and use a second-generation SGA.
Plan C was to maintain oxygenation by simple facial mask, with two operators, for optimization of an open airway under general anesthesia and neuromuscular relaxation, or for the use of an alternative SGA, as needed.
Plan D included management with a surgical infraglottic device with local anesthesia +/- sedation, if necessary.
Plan E was an optional supplementary use of a flexible bronchoscope, for any of plans A, B, or C, to carry out intubation through the SGA, or in combination with the VL, as needed, or to be used as a solo device.

**Clinical course:**
The patient signed the consent, and after a six-hour period of fasting (which was predicted to be very tolerable for her condition), she was taken into the opera-
ting room for surgery. She was monitored with pulse oximetry, ECG, and non-invasive blood pressure. She was given 50 µg of intravenous fentanyl and 50% O₂ via face mask. Nebulization included 5 mL of 2% lidocaine by mask for 20 minutes (Figure 2). Her O₂ saturations were 98-100%.

Remifentanil was begun at 0.5 µg/kg/min intravenously, with increasing doses administered by a volumetric pump, to achieve a sedation state of 3 on the Ramsay scale. With one operator using the VL to slowly perform laryngoscopy, a second operator applied local anesthesia (LA) under VL monitoring, with the help of a MADgic atomizer (Teleflex Medical Research, Triangle Park, NC). Less than 5 mg/kg of 2% lidocaine—well under the maximum recommended—was given intraorally in a "modified spray-as-you-go" method, initially on the pharyngeal portion of the tongue, later in the vallecula (Figure 3), and finally on the glottic opening (Figure 4) where it was directed inward toward the trachea.¹

Subsequently, the patient was intubated successfully with the VL on the first try (Figure 5). The surgical procedure was carried out smoothly and the patient was transferred to the recovery room (Figure 6).

Discussion: Strategies to deal with airway management in the awake patient are useful alternatives when general anesthesia and abolition of ventilation is considered dangerous.² Frequently, VL options have been shown to be effective in this type of approach.³ Although this patient’s examination showed no worrisome levels of predictive airway difficulty, periodically, it has been documented that the quality of information based only on the predictors, can have a serious failure rate.⁴

However, the most important thing that tipped the balance toward our awake approach was the progressive development of her present illness in association with the CT images. It should be noted that the supplementary evaluation of airway management difficulty based on static images (CT, radiographs, and magnetic resonance imaging [MRI]); or dynamic ones (ultrasonography and flexible nasal endoscopy), achieves a higher relevance in detection rate and planning for coping strategies.

Another interesting aspect of our approach is that we followed the guidelines of
the Difficult Airway Society (DAS), consisting of several alternative plans in case of significant failure of one or more of them. It is always vital to maintain alternative options, and especially have in mind the constant continued intent for support of adequate patient oxygenation.

Finally, we employed a “modified spray-as-you-go” technique with simultaneous VL use, to apply LA topically as we edged the VL closer to the larynx. Historically, spray-as-you-go for the administration of LA during awake intubations, has usually been performed with flexible fiberoptic or non-fiberoptic endoscopes. This technique is executed by attaching a syringe of 2 to 4% lidocaine on the endoscope’s working (suction) port, or to an epidural catheter threaded down the working channel to effect a more jet-like spray.

For the “modified spray-as-you-go technique,” the MADgic atomizer is uniquely suited because its malleable stylet permits shaping as desired to conform to anatomy. Plus, it has excellent atomizing action. In combination with the VL, the “modified spray-as-you-go” application is performed during direct observation of the atomizer on the VL screen. This permits more accurate topicalization and less likely to result in higher dosages.

Conclusion: the VL is a useful device not only to effect successful intubation in awake patients, but also to use in conjunction with a MADgic atomizer to assist with a “modified spray-as-you-go” technique for the administration of LA to the airway.

References: