Laryngotracheal Lidocaine and Extubation Guideline

I was pleased to read the new Difficult Airway Society guidelines for extubation and the associated editorial [1, 2]. While many important ‘advanced extubation techniques’ were presented, lidocaine topicalisation, including that first described by Burton-Zornow via tracheal tube instillation (B-Z-I) in 1997, was not included [3, 4]. This technique is extremely useful in securing optimal extubation conditions by completely suppressing the adverse reflex activity caused by the presence and removal of the tracheal tube. The stimulation at extubation is rendered less than that of removing a laryngeal mask airway in the majority of cases, and I have demonstrated complete tracheal mucosal topicalisation by repeated, rapid deflation-inflation of the cuff, within 40 seconds of applying lidocaine (1, 2 or 4%). Detailed descriptions are referenced below [5, 6], but the essentials of the technique are provided here, can be rapidly learned in routine anaesthetic practice and are dependent on propelling the lidocaine through and upward from the distal tip of the tracheal tube into the mouth, anaesthetising the tracheal mucosa adjacent to the tube. Placing the tracheal tube with the cuff just distal to the vocal cords facilitates effectiveness by concentrating the effects of the lidocaine on the upper trachea and vocal cords. The only contraindications remain lidocaine allergy and a risk of aspiration.

1. Before reversal of neuromuscular blockade or emergence from surgical anaesthesia, the cuff of the tracheal tube is completely deflated.
2. With the fresh gas flow set at 3-6 l.min⁻¹, 1-2 mg.kg⁻¹ lidocaine in 5-10 ml volume in a syringe is attached at the 90° connector via the CO2 luer-lock sampling port to the proximal end of the tracheal tube, with a closed adjustable pressure-limiting valve. The full 3-l reservoir bag is expelled manually as the lidocaine is given slowly, beginning at the onset of audible escape of gas from the mouth; both volumes should finish together. This insures maximal distribution of lidocaine upward from the tip of the tube. (This may lead to coughing or movement if the patient is inadequately anesthetised/paralysed).
3. The cuff is reinflated and preparations for reversal/extubation/emergence made.
4. With resumption of spontaneous ventilation, the tracheal tube cuff is now rapidly and forcibly deflated/reinfated to detect any change in respiratory pattern or coughing, as an indication of ineffective topical effects (repeat instillation typically converts a failure into success). Topicalisation will persist reliably for 20 minutes only.
5. As clinically indicated, opioids may be titrated to respiratory parameters during emergence.
6. The trachea can be extubated with the patient deep, awake or anywhere in between without noxious reflex activity leading to hypertension, tachycardia or laryngospasm.

Smokers and patients with excessive tracheal secretions warrant high concentrations, whilst 1% lidocaine is adequate in healthy individuals. I have not had the chance to perform this technique in paediatric patients below the age of 2.

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References.