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Titrated safe extubation: application of an original strategy for safe management of perioperative glottis edema with severe upper airway obstruction

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Sir: Usual approach to traumatic laryngeal oedema with glottis obstruction can be harmful. Long-term orotracheal intubation and a prolonged stay of airway exchange catheters (AECs) could make the patient suffer new lesions [1]; therefore bed immobility and ICU stay could be prolonged. Airway emergencies during tracheal extubation phase are still associated with death or brain damage, indicating that additional management strategies are required to improve patient safety [2].

We report the application of new approach to safe extubation in a case of iatrogenic upper airways obstruction. A 62-year-old woman (weight 75 kg, height 155 cm, BMI 31.2) was scheduled for an Heller's extramucosal cardiomyotomy. An unexpected difficult intubation occurred. Successful orotracheal intubation with a 7.0 mm ID tube was reached at the third attempt by using a Frova introducer. Following the intubation, laceration of the oesophageal mucosa with massive glottis oedema was detected. Surgery was delayed and the patient was admitted to ICU in order to plan a safe extubation.

Our goal was to remove the orotracheal tube from patient's trachea and perform a fiberoptic diagnosis on a free glottis. If she was able to breath, a guidewire (Baxter®, hidrophylic Teflon™, J, Ø 0.035i, length 150 cm) would have been placed in her airway as a marker for re-intubation. But our patient was unable to breath spontaneously (a cuff-leak test [3] resulted positive, tirage and oxygen desaturation occurred during safe extubation) so a nasal re-intubation with a smaller and cuffless tube (Rüsch®, SilkoClear Flex™, ID 4.5 mm, lenght 25 cm) (NT) was performed. It was under fiberoptic surveillance (video bronchoscope Pentax® FB 18, Ø 6 mm) and local anaesthesia, over the guidewire and an AEC (Cook® No. 11, OD 4 mm) (Fig. 1). The NT placement resolved

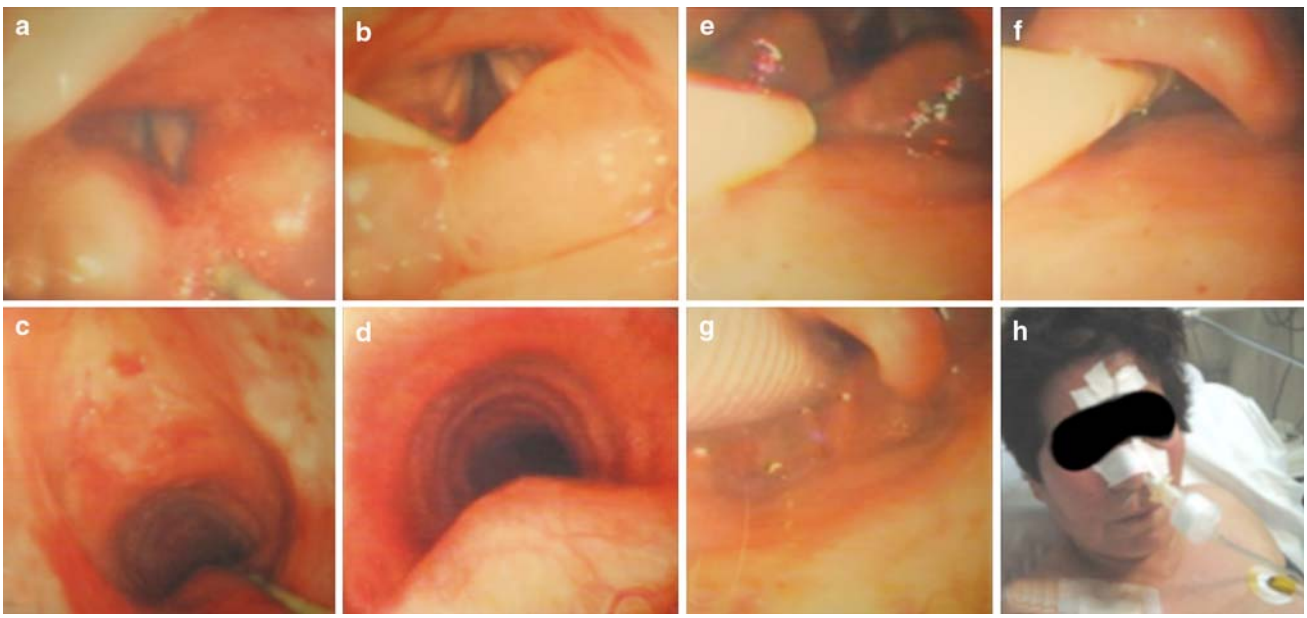

Fig. 1 Rhino-laryngeal fiberoptic bronchoscopy. **a** Glottis oedema and hyperemia; **b** wellfunctioning vocal cords; **c** oedema and hyperemia in subcordal region with secretions and fibrin depot during exhalation; **d** pars membranacea protruding with mild tracheal stenosis during inhalation. **e**–**h** Uncuffed rhino-tracheal tube placement: **e** the guidewire reintroduced in the windpipe lumen via fiberoptic bronchoscope working channel and the tube-exchanger placement on it along the rhino-tracheal route; the fiberoptic surveillance is carried out through the controlateral nostril; **f** tube-exchanger placed under epiglottis; **g** uncuffed rhino-tracheal tube placed in trachea on the tube-exchanger; **h** the patient adapted in spontaneous breathing with the phonetic valve and uncuffed rhino-tracheal tube placed

immediately the mechanical obstruction and the patient promptly started to breath spontaneously without ventilator support; she was awake, quiet, cooperating and able to perform a feeble phonation thanks to the phonation valve (Rüsch®, Plastic Spiro™) mounted on the NT (Fig. 1h). Our patient was definitively extubated 3 days after and discharged the next day.

We focused our attention on a patient whom previous studies would have defined impossible to extubate [4] and we successfully had made her able to breath spontaneously and speeded up her discharging. We think that a good way to manage this kind of patient is to titrate the safe extubation, abandoning the idea that the patient can be only intubated with a large diameter endotracheal tube or extubated. We chose the smallest size tube which would allow the patient to inhale without excessively increase pressure gradient to maintain flow, supposing a 4.5-mm ID tube could have been suitable for the purpose. We succesfully chose this ID empirically, on the basis of our clinical experience with translaringeal open ventilation (TOV) [5] and the patient's BMI. If necessary, this method can allow to support patient breathing applying a TOV in pressure support ventilation. It can be useful to test this new approach on a cohort of patients.

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