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Rescue intubation via I-Gel® device in Pierre-Robin sequence

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- Letter to the Editor -

To the Editor,

Pediatric difficult airway is defined as a situation in which the operator experiences difficulty in mask ventilation, direct or assisted laryngoscopy, tracheal intubation, supraglottic airway device use, or surgical airway. It is a clinical scenario which can quickly become an emergency and constitutes itself a risk factor for morbidity and mortality. The incidence of difficult tracheal intubation is up to 3\% and one out of five are unanticipated (mostly related to unidentified facial dysmorphic features). Complications appear in $\geq 20\%$ of the children (mainly by hypoxemia), largely associated with repeated attempts at laryngoscopy ($\geq 3$ attempts) and intubation ($\geq 2$ attempts) [1].

Written informed consent for the publication of this article was obtained from the parents of the patients.

We present two toddlers with Pierre-Robin sequence and difficult airway, who underwent rescue intubation through an I-Gel\textsuperscript{\textregistered} supraglottic airway device during the perioperative care of cleft palate surgery. Both were 20-month-old children, classified as American Society of Anesthesiologists (ASA) physical status II, and weighing 9-10 kg. Multiple attempts at laryngoscope (Cormack-Lehane $\geq 3b$) and videolaryngoscope were performed by experienced pediatric operators and episodes of desaturation (with abundant secretions and some blood) occurred in both cases [2]. Considering the difficult airway, the repeated attempts at laryngoscope, and the hypoxemia episodes, we decided to undertake intubation through a supraglottic airway device. We inserted an I-Gel\textsuperscript{\textregistered} airway device (nº 2) for mechanical ventilation and performed a fibroscopy (2.8 mm) through a double swivel elbow (with seal-opening), visualizing the following
structures: Epiglottis partially covering larynx (classification of fiber optic vision through supraglottic device grade 3-4), larynx with supraglottic edema and secretions, trachea and carina [3]. Afterwards, we passed an uncuffed tracheal tube (nº 4) through the elbow (maintaining the mechanical ventilation), removed the supraglottic device by using another tracheal tube as stabilizer, and connected it again to the ventilator. Finally, we checked the waveform capnography and the correct placement of the tube proximal to carina through a new fibroscopy.

**Pierre-Robin sequence** is defined as the presence of micrognathia, glossoptosis and airway obstruction (as well as cleft palate in 50% of patients), and can be associated with respiratory and feeding difficulty to varying degrees. The incidence varies from 1:5000 to 1:85000 due to the variability of clinical presentation, leading to underdiagnosis of patients with mild symptoms, who may present unanticipated difficult airways [4]. The latter occurred in one of the patient reported, who had not been diagnosed with Pierre-Robin sequence when scheduled for the surgery. The second child had a history of Pierre-Robin sequence. However, as his anatomical conditions seemed to be favorable, the anesthesiologist decided to perform a direct laryngoscopy under sedation as a first approach to case management.

The management of unanticipated difficult tracheal intubation in pediatric patients should be based on the early identification and the use of evidence-based algorithms. Such algorithms should be adapted to the available resources and clinical experience, and simplified to the minimum necessary information to ensure the adherence of professionals and ease of use. Likewise, intubation attempts should be limited, technique and/or operator should be changed in every attempt, and intubation assist devices should be used promptly. The damage produced by repeated attempts at intubation (secretions, bleeding and supraglottic edema) may compromise ventilation and oxygenation. Supraglottic airway devices are the best choice for rescue ventilation and can be used as conduits for intubation (Video). Fibroscopy-guided intubation through a supraglottic device is
well described in the literature, but however, guidelines for the difficult airway management indicate to perform it in late stages of the process [5].

*I-Gel*® *supraglottic airway devices* have an optimal profile for the management of difficult airway in children, given the ease of insertion (non-inflatable *cuff*); high leak pressures (>25 cmH₂O), which allows a more demanding positive pressure ventilation; a gastric channel for decompression of the stomach; and a wide airway diameter, which allows the introduction of endotracheal tubes and fiberscopes with different diameter ranges [6].

Fibroscopy-guided intubation through a *supraglottic airway device* has higher rates of global success, higher rates of first-attempt success in children younger than one year of age, and lower rates of hypoxemia than videolaryngoscopy (by allowing mechanical ventilation during the procedure). Since laryngoscopy and videolaryngoscopy are performed in apnea, they can potentially be associated with hypoxemia, with a higher number of intubation attempts (given the need to interrupt the technique to ventilate the patient), and with more damage to the airway. It is also important to check the compatibility of diameters between the fiberscope, tracheal tube, and supraglottic airway device, as well as to examine the passage of tracheal tube through the elbow with seal-opening, to complete the intubation procedure without disconnecting from mechanical ventilation [6, 7].

Therefore, based on our experience, we strongly recommend the early use of fibroscopy-guided intubation through the I-Gel® supraglottic device for unanticipated tracheal intubation with a Cormack-Lehane ≥3 (Fig. 1) or with secretions, bleeding or hypoxemia, obtaining a high success rate. Although the supraglottic devices as first choice for this technique are Air-Q® and Aura-i® (having more studies published), I-Gel® has the following advantages over them: 1) It provides a wider airway channel which allows for a better vision and the passage of tracheal tubes and
fiberscopes with larger diameters; 2) there is no need to disconnect from mechanical ventilation for the passage of tracheal tubes, as in the case of Air-Q®.

In conclusion, we consider the fibroscopy-guided intubation through a supraglottic device a safe and effective procedure, which should be promptly indicated as an intubation rescue technique in pediatric patients, since it reduces the number of attempts at laryngoscopy and intubation. Likewise, we consider I-Gel® an excellent choice as a supraglottic device to carry out this procedure, although further studies providing new evidence in its application to this technique are needed.
References


**Figure 1.** Algorithm for the management of the unanticipated difficult intubation in our pediatric anesthesia program (developed and adapted from international clinical guidelines).