

## Pediatric difficult airway: Video laryngoscope to the rescue

Sir,

A 5-year-old male child, operated case of craniovertebral junction anomaly, was scheduled for ventriculoperitoneal shunt surgery. One year back, the child had undergone foramen magnum decompression and occipitocervical fixation. Following the first surgery, the child developed quadriplegia associated with progressively developing cervical encephalocele and hydrocephalus. Pre-operative assessment revealed a large head (head circumference 55 cm), narrow mouth with high arched palate and maloccluded dentition, severely restricted neck movements in all planes and modified Mallampati Class IV airway. Computed tomography scan head revealed hydrocephalus, C1 arch reversal and *in situ* posterior fixation with magnetic

resonance imaging suggestive of Chiari type I malformation and tonsillar herniation. In view of anticipated difficult airway, he was planned for fiberoptic bronchoscope guided tracheal intubation under general anesthesia. A difficult airway cart was kept ready before induction and the surgeon alerted to obtain emergent surgical airway access as a backup plan. Child was premedicated with oral atropine. After attaching standard monitors, general anesthesia was induced with propofol 2 mg/kg and fentanyl 2 mcg/kg. As adequate depth of anesthesia was attained, and mask ventilation was possible, neuromuscular paralysis was achieved with atracurium 0.5 mg/kg and fiberoptic bronchoscopy attempted. After multiple unsuccessful attempts at fiberoptic bronchoscopy, direct laryngoscopy was tried, which revealed a Cormack Lehane (CL) Grade IV. At this stage, the head position was readjusted by placing extra pillow under the head, which improved view to CL Grade III with external laryngeal maneuver. Encouraged by this, we attempted airway control using airway adjuncts as bougie, air Q and fiberoptic bronchoscopy successively, all of which failed. Multiple intubation attempts led to difficulty in mask ventilation and progressive early desaturation. At this time, it was difficult to place laryngeal mask airway/air Q due to narrow mouth and intubation with C-MAC video laryngoscope was attempted as a desperate measure before abandoning the surgical procedure and awakening the child. To our surprise, though CL grade was same, video laryngoscopy allowed placement of bougie in a single attempt. Size 5.0 endotracheal tube was threaded over the bougie and secured after confirming correct placement. Subsequent intraoperative course was uneventful. At the end of the procedure, neuromuscular blockade was reversed and airway exchange catheter placed and finally safely extubated postoperatively in the intensive care unit. The child was monitored in the intensive care unit and maintained oxygenation throughout the stay.

Fiberoptic bronchoscope is considered the gold standard for managing an anticipated difficult airway.<sup>[1,2]</sup> However, the success rate may not always be 100% as it requires expertise and the limitations of its use in the presence of blood or secretions. We were unsuccessful in fiberoptic bronchoscopy guided tracheal intubation because of fogging due to secretions, earlier desaturation and progressively deteriorating mask ventilation, which necessitated urgent need to secure airway in the paralyzed child. Though placing an extra pillow under the occiput improved the laryngeal view, it was not adequate to allow passing the endotracheal tube or even the bougie despite multiple attempts. However, without changing the head position, when we switched over to the video laryngoscope, we

could intubate in a single attempt. Though inhalation induction is a preferred option in a pediatric difficult airway situation, we preferred propofol induction in view of raised intracranial pressure and paralyzed the child only once mask ventilation was confirmed to allow best possible intubating conditions.

Video laryngoscope provided us a magnified glottic view and offered us a better orientation of the glottic opening in relation to other oropharyngeal structures which helped us pass the bougie and subsequently the endotracheal tube with comparative ease. A video laryngoscope provides a magnified superior glottic view as compared with conventional laryngoscopy.<sup>[3]</sup> In addition, it is an easy to acquire skill, is intuitive, takes lesser time and allows the assistant to provide correct airway manipulation. Our case emphasizes that by giving a magnified view of the glottic opening and the oropharyngeal structures, video laryngoscopy provides better visualization for intubation. This may be more relevant in infants and small children where the advantage of a magnified view may be many times more than adult patients. Current research also supports obvious advantage of video laryngoscope over conventional direct laryngoscopy in pediatric difficult airway.<sup>[4,5]</sup> Though there are conflicting results of poor glottic view and longer intubation time in children with cervical spine fixation,<sup>[6]</sup>; we report successful use in our patient.

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