

Title: Recurrent Respiratory Papillomatosis Presenting as Acute Airway Obstruction After Induction of Anesthesia

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#### ABSTRACT BODY:

**Introduction:** Laryngeal papillomatosis, also known as Recurrent Respiratory Papillomatosis (RRP) is a benign lesion of the larynx that is more common in children than adults. The course of RRP is unpredictable, as it may spread throughout the respiratory tract and cause airway obstruction, requiring frequent surgical debulking. Here we present a child with RRP and unexpected complete airway obstruction undergoing CO<sub>2</sub> laser excision of laryngeal papilloma using total intravenous anesthesia and high frequency jet ventilation.

**Case Report:** A 10 year old boy, weighing 44 kilograms, with a longstanding history of RRP, presented to the Otolaryngology clinic complaining of hoarseness and increasing difficulty breathing over the past week. He had undergone two prior surgeries with CO<sub>2</sub> laser excision of laryngeal papilloma in the past two years. Fiberoptic laryngoscopy revealed a bulky papilloma involving nearly the entire left true vocal cord; the right vocal cord appeared uninvolved. With these findings, he was admitted to the hospital and scheduled for urgent laryngeal papilloma excision.

An intravenous was placed in the pre-op holding unit and premedication was limited to midazolam 2 mg prior to anesthesia induction. He was placed in the supine position and standard ASA monitors were utilized including electrocardiography (EKG), noninvasive blood pressure measurement, capnography and pulse oximetry (SpO<sub>2</sub>). Anesthesia was induced with lidocaine 50 mg and propofol 100 mg, while simultaneously initiating total intravenous anesthesia with remifentanyl 0.5 mcg/kg/min and propofol 150 mcg/kg/min. At this point, he was mask ventilated with moderate difficulty. Shallow chest rise was noted with only small measurements of end tidal CO<sub>2</sub>, which was thought to be a consequence of airway obstruction, rather than poor mask seal. The surgeon and anesthesiologist discussed the safest way to continue with the case, given the possibility of acute airway obstruction. The final decision was to proceed with paralysis, only after the CO<sub>2</sub> laser was on stand by, ready for emergent use. Rocuronium 20 mg and dexamethasone 4 mg were given intravenously. The surgeon performed a direct laryngoscopy which revealed complete airway obstruction by the laryngeal papilloma (Figure 1). High frequency jet ventilation (HFJV) was utilized with poor chest rise. After a short sequence of CO<sub>2</sub> laser ablation to relieve the airway obstruction, ventilation was restored with a significant improvement in chest rise. Of note, an intraoperative arterial blood gas at the conclusion of the case revealed a pH of 7.11, PaO<sub>2</sub> of 140 mmHg and a PaCO<sub>2</sub> of 99.1 mmHg while utilizing HFJV. After complete excision of the laryngeal papilloma (Figure 2), mask ventilation was restarted without difficulty and the infusions of propofol and remifentanyl were suspended. Spontaneous respiration and emergence from anesthesia was noted within five minutes. Oxygen saturation remained at 100% throughout the case and he was transferred to the PICU for continuous airway monitoring. The peri-operative period was uneventful and he was subsequently discharged home without incident on the first post-operative day.

**Discussion:** This case highlights the need for the anesthesiologist to maintain constant vigilance during surgical airway procedures. Communication between the surgeon and anesthesiologist is mandatory prior to and throughout the surgery to provide the safest management of the patient. Once a plan has been implemented by the team, an alternative should also be prepared, in the event of failure. In this case, the strategy was to prepare the CO<sub>2</sub> laser for immediate use, and then proceed with paralysis and HFJV. Possible alternatives included endotracheal intubation or preparation for awake tracheostomy, understanding that the patient would be at risk for displacement of the papilloma or bleeding. Total intravenous anesthesia was employed, given the use of HFJV

and to facilitate the patient's emergence from anesthesia.

In conclusion, we managed a patient diagnosed with RRP, who subsequently suffered complete airway obstruction after induction. We stress the importance of communication and vigilance when performing surgery on the airway.

## REFERENCES

Soldatski IL, Onufrieva EK, Steklov AM, et al. Tracheal, Bronchial and Pulmonary Papillomatosis in Children. *The Laryngoscope* 2005; 115:1848-1854.

