Title: Prevention of Post-Extubation Laryngospasm After Tonsilectomy

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Upper airway obstruction and/or laryngospasm is a serious problem after tonsilectomy which is caused by foreign body (blood or endotracheal tube) stimulation of the vocal cords or trachea, manipulation (extubation) of the upper airway in a light or partially anesthetized patient, irritation of upper airway reflexes and probably many other factors. Positive airway pressure, increased anesthesia and/or employment of a muscle relaxant are treatments for upper airway obstruction and laryngospasm after extubation but these remedies promote gastric distention and prolonged postoperative recovery times. Recent experiences in our operating rooms have suggested that intravenous lidocaine just prior to extubation markedly decreases the incidence and magnitude of upper airway obstruction and/or laryngospasm following extubation after tonsilectomy. The object of this study was to evaluate this therapy in children following tonsilectomy.

One hundred ASA Class I children aged 2-8 years and scheduled to undergo elective tonsilectomy and adenoidectomy served as the experimental subjects. The patients were all out-patients prior to operation and were not premedicated. After routine preoperative preparations, the children were anesthetized with halothane (2-3%), nitrous oxide (60%) and oxygen. Following induction of anesthesia an intravenous infusion was started, atropine (0.2 mg) was administered intravenously and the patients were intubated without the need of a muscle relaxant. At the conclusion of the operation all patients were spontaneously breathing. At this time halothane and nitrous oxide were discontinued, the posterior larynx was suctioned to drynesss and either one percent lidocaine (1 mg/kg, group A) or normal saline (1 ml/10 kg, group B) were administered rapidly intravenously by an individual other than the anesthesiologist. Two minutes later the patients were extubated and one minute following this their airways were evaluated and graded by the anesthesiologist according to the following schema: 1 = good gas exchange, no evidence of airway obstruction, retraction or laryngospasm and no need for support of the chin; 2 = some evidence of airway obstruction, retraction or laryngospasm with evidence of impaired air exchange and/or need for chin support; 3 = complete airway obstruction or laryngospasm with no pulmonary ventilation and gas exchange.

There were 50 patients in each group. Average age, weight, duration of operation and percent halothane utilized were similar in the two groups. No patient in group A experienced laryngospasm or complete airway obstruction and only 3 (6%) had evidence of mild or partial airway obstruction after extubation, Table 1. In contrast, 4 patients (8%) in group B experienced complete airway obstruction and 8 (16%) had partial airway obstruction one minute following extubation. These differences between groups A and B are statistically significant using the chi-square test.

These data demonstrate that intravenous lidocaine (1 mg/kg) at the end of tonsilectomy operation prevents laryngospasm and significantly reduces upper airway obstruction after endotracheal extubation.

TABLE 1

Percent of Patients with Post-Extubation Laryngospasm or Obstruction

SCORE:	1 No Spasm or Obstruction	2 Mild Spasm or Obstruction	3 Severe (Complete) Spasm or Obstruction
Group A (lidocaine)	94	6	0
Group B (saline)	76*	16*	8*

*P <.025, chi-square test when compared to group A values.