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Airway Obstruction and Inability to Ventilate Due to Swollen Uvula following Adenotonsillectomy in a Three-year Old Child

Dear Editor,

Sir,

Adenotonsillectomy is one of the commonly done day care surgical procedures in paediatric patients. Airway obstruction following adenotonsillectomy requiring intubation in paediatric patients is one of the potential complications, and has been reported only in two cases in the literature (1, 2). In neither of the two cases was ventilation reported to be difficult. The inability to ventilate can be catastrophic. We present the first reported case of airway obstruction and inability to ventilate due to swollen uvula following adenotonsillectomy.

A three-year old girl, weighing 15 kg, with recurrent attacks of tonsillitis was scheduled for elective adenotonsillectomy. She also had features of obstructive sleep apnoea (OSA). Apart from being allergic to penicillin, the preoperative assessment was unremarkable. The child was induced with propofol (30 mg), fentanyl (30 µg) and cisatracurium (2 mg). Following uneventful mask ventilation, orotracheal intubation was achieved on first attempt with 5 mm uncuffed tracheal tube. The patient was positioned with neck extension and mouth opened with Davis Boyle mouth gag. Adenoids were removed using a curette. Both tonsils were dissected and removed by applying a tonsillectomy snare to the lower poles. Haemostasis was achieved with packing and diathermy of bleeding vessels. In this child, the dissection of tonsils was technically difficult, resulting in longer operative time. Hence, laryngoscopy was done prior to extubation and a moderate uvular swelling was noted (Figure). Dexamethasone 4 mg and ranitidine 15 mg were administered intravenously. Neuromuscular blockade was reversed and extubation was performed when the child was awake in the post-tonsillectomy position.

Following extubation, the child was initially breathing normally but progressively developed obstructed breathing which was thought to be due to the observed uvular swelling. Over the next three minutes, SpO₂ started to fall below 90%

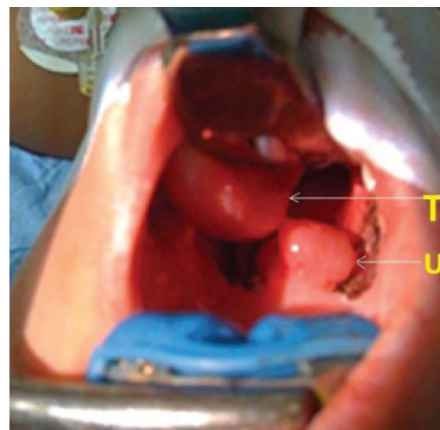


Figure: Direct laryngoscopy immediately following surgery showing swollen uvula.

T: tongue, U: uvula.

and she became bradycardic. Attempts to perform mask ventilation with oral airway were unsuccessful. She was thus administered glycopyrrolate IV, followed by suxamethonium (0.5 mg/kg). Mask ventilation was still not possible, suggesting supraglottic swelling only. Urgent laryngoscopy was done and the trachea was intubated with a 5.0 mm uncuffed tube. Following intubation, oxygen saturation and heart rate returned to normal. Nasal endoscopy confirmed worsening swelling of the uvula with no further abnormal findings. The patient's sedation, dexamethasone and ventilation were continued for 24 hours. The patient's intensive care unit course remained uneventful and after 24 hours, direct laryngoscopy showed that uvular swelling had subsided significantly. The child was extubated uneventfully and was discharged home on the third postoperative day.

Compared with adults, children have a two-fold higher incidence of fatal respiratory events in the postoperative period following adenotonsillectomy (3). One of the rare causes of airway obstruction following adenotonsillectomy is uvular swelling (4). In this patient, the technical difficulty in performing adenotonsillectomy would have resulted in uvular swelling leading to airway obstruction. The patient had OSA which can cause vascular engorgement of the uvula and compound the problem (5). It is possible that the negative pressure generated in the airway at the onset of spontaneous breathing gradually drew the swollen uvula toward the glottis, resulting in worsening uvular swelling and leading to complete airway obstruction. Hence, bag mask ventilation, even with oral airway, was unsuccessful. Failure to ventilate even after suxamethonium administration rules out laryngospasm. No other causes of airway obstruction were apparent on direct laryngoscopy. In retrospect, having noticed moderate uvular swelling before extubation, elective ventilation until the swelling subsided could have been a better option.

In conclusion, uvular oedema should be recognized as one of the potential causes of airway obstruction following adenotonsillectomy. The obstruction could lead to potentially dangerous "cannot ventilate" situation. In difficult oropharyngeal surgeries, direct laryngoscopy preceding extubation and a high degree of suspicion can avoid catastrophic complication.

Keywords: Adenotonsillectomy, tonsillitis, swollen uvula

S Kinthala and Y Kumar Areti

From: Department of Anesthesiology and Surgical Intensive Care, Queen Elizabeth Hospital, Bridgetown, Barbados.

*Correspondence: Dr S Kinthala, Department of Anesthesiology and Surgical Intensive Care, Queen Elizabeth Hospital, Bridgetown, Barbados. Fax: 124 64274423
e-mail: sudhakarkinthalaresearch@yahoo.co.uk*

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