



Anaesthetic Management of Unanticipated Difficult Airway in a Syndromic Child Undergoing Tonsillectomy: Successful Management with Fiberoptic Intubation and Jet Ventilation

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KEYWORDS

Difficult airway, fiberoptic intubation, jet ventilation, tonsillectomy, anaesthesia risk, syndromic child.

ABSTRACT:

Background: Airway management in syndromic children poses a significant anaesthetic risk due to craniofacial anomalies and unpredictable airway anatomy. Tonsillectomy further increases the risk of airway compromise.

Case Presentation: We report a 16-year-old male with syndromic features posted for tonsillectomy who developed an unanticipated difficult airway. After induction, an initial attempt at laryngoscopy failed due to vomiting and inability to mask ventilate effectively. To secure the airway, fiberoptic intubation using a Portex endotracheal tube (ETT) was attempted. During the procedure, oxygenation was maintained with jet ventilation via nasal cannula. The airway was successfully secured, and the surgery proceeded uneventfully.

Conclusion: This case highlights the importance of preparedness, multimodal airway strategies, and the role of fiberoptic intubation with adjunctive oxygenation techniques in managing unanticipated difficult airways in syndromic patients.

INTRODUCTION

Airway management in paediatric patients poses unique challenges due to anatomical and physiological differences from adults. Children have a proportionally larger tongue, a cephalad and anterior larynx, a relatively narrower subglottic airway, and increased oxygen consumption with limited functional residual capacity, all of which predispose to rapid desaturation during airway manipulation¹. Preoperative airway assessment is therefore crucial, but it may not always predict a difficult airway. Syndromic children often present with craniofacial anomalies, micrognathia, macroglossia, or restricted neck movement, increasing the risk of both difficult mask ventilation and intubation². In such cases, a clear plan with alternative airway devices and rescue strategies is essential. Tonsillectomy, by itself, increases the risk of airway compromise because of the surgical

field, potential for bleeding, and increased aspiration risk³. Unanticipated difficult airway in this setting demands rapid decision-making and the ability to switch between airway management techniques to prevent hypoxia. This report describes the airway management of a syndromic adolescent undergoing tonsillectomy, where unanticipated difficulty required the use of multiple rescue strategies, culminating in successful fiberoptic intubation with maintenance of oxygenation via nasal jet ventilation.

Patient Information

Age/Gender: 16-year-old female

Medical History: Known case of OSA since childhood

Presenting Symptoms: Progressive mouth breathing since past 2 months



Family and Social History: No relevant family history

Medications: Nil relevant

Clinical Findings

Respiratory rate: 22/min

Saturation: 96% on room air

Auscultation: Bilateral air entry present

Blood pressure: 90/60 mmHg

Heart rate: 92 bpm

THERAPEUTIC INTERVENTION

A 16-year-old male child with syndromic features was scheduled for tonsillectomy under general anaesthesia. Preoperative evaluation did not reveal significant predictors of a difficult airway.

After induction of anaesthesia with standard monitoring, bag-mask ventilation was initially attempted but was inadequate due to poor seal and airway obstruction following a sudden episode of vomiting. Oro- and nasopharyngeal suctioning was performed, but repeated attempts at mask ventilation failed. An oropharyngeal airway was inserted with no improvement. Oxygen saturation began to fall, necessitating rapid escalation to advanced airway techniques. Direct laryngoscopy was attempted but provided a poor view (Cormack–Lehane grade III) due to distorted airway anatomy and secretions. A supraglottic airway device was considered but not feasible due to the ongoing tonsillar hypertrophy and risk of aspiration. Given the inability to ventilate or intubate, a decision was made to proceed with fiberoptic intubation. To maintain oxygenation during preparation, jet ventilation was administered via a nasal cannula, providing apnoeic oxygenation and intermittent insufflation⁴. The fiberoptic bronchoscope was introduced via the oral route, and a Portex endotracheal tube was railroaded successfully over the scope into the trachea. Adequate bilateral breath sounds were confirmed, oxygen saturation improved, and the airway was secured. The surgery proceeded without further complications. Post-operative recovery was uneventful.

Follow-up and Outcomes

Immediate postoperative recovery stable

Discharged on postoperative day 3

DISCUSSION

Unanticipated difficult airway remains one of the most feared scenarios in paediatric anaesthesia. Syndromic children often have subtle anatomical changes not evident during routine airway assessment, leading to false reassurance. Preoperative airway evaluation in

children should include not only Mallampati classification and thyromental distance, but also assessment for facial asymmetry, jaw mobility, dentition, and history of obstructive sleep apnoea or stridor⁵. In this case, despite a seemingly adequate preoperative assessment, the combination of vomiting, airway obstruction, and anatomical anomalies led to a cannot intubate–cannot ventilate situation. The rapid use of multiple techniques—mask ventilation, airway adjuncts, suctioning, laryngoscopy—demonstrates adherence to difficult airway algorithms⁶. Fiberoptic intubation is considered the gold standard for managing anticipated or unanticipated difficult airways in children, especially when direct visualization is impaired⁷. The adjunct use of jet ventilation via nasal cannula allowed oxygenation during the apnoeic period, preventing critical desaturation⁸. This case emphasizes the importance of:

- Preparedness: advanced airway devices must always be available in paediatric airway surgeries.
- Multimodal strategy: use of adjuncts and rapid progression through algorithms when one technique fails.
- Maintaining oxygenation: even when ventilation is not possible, apnoeic oxygenation and jet ventilation can be lifesaving.

CONCLUSION

This case highlights the successful use of fiberoptic intubation with jet ventilation as a rescue technique in managing an unanticipated difficult airway during tonsillectomy in a syndromic child. Preparedness and the availability of advanced airway devices are critical for improving patient safety in high-risk anaesthetic scenarios.

Informed Consent

Written informed consent was obtained from the patient for publication of this case and associated images.

Ethical Approval

According to the policy of our institution, individual case reports do not require review or approval by the institutional ethics committee. However, written informed consent was obtained from the patient for the publication of this case report and any accompanying clinical details.

Conflicts of Interest

None declared.

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REFERENCES

1. Rosenblatt WH, Sukhupragarn W. Airway management in children with craniofacial syndromes. *Curr Opin Anaesthesiol.* 2011;24(3):282-9.
2. Apfelbaum JL, Hagberg CA, Caplan RA, *et al.* Practice guidelines for management of the difficult airway. *Anesthesiology.* 2022;136(1):31-81.
3. Cook TM, Woodall N, Frerk C; Fourth National Audit Project. Major complications of airway management in the UK. *Br J Anaesth.* 2011;106(5):617-31.
4. Henderson JJ, Popat MT, Latto IP, Pearce AC. Difficult Airway Society guidelines for management of the unanticipated difficult intubation. *Anaesthesia.* 2004;59(7):675-94.
5. Jagannathan N, Sohn L, Ramsey MAE, *et al.* Airway management complications in children. *Curr Opin Anaesthesiol.* 2016;29(3):326-32.
6. Frerk C, Mitchell VS, McNarry AF, *et al.* Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults. *Br J Anaesth.* 2015;115(6):827-48.
7. Weiss M, Engelhardt T. Proposal for the management of the unexpected difficult pediatric airway. *Paediatr Anaesth.* 2010;20(5):454-64.
8. Mort TC. Continuous airway access for the difficult extubation: the efficacy of the airway exchange catheter. *Anesth Analg.* 2007;105(5):1357-62.