

Maxillary tumor in a child: An expected case of difficult airway

ABSTRACT

Craniofacial abnormalities in pediatric population fall under the category of expected case of difficult airway. We present here a case of large maxillary tumor in a 9-year-old girl where the relative difficulty was further compounded due to her noncooperation which was again expected from a child. Local anesthetic topicalization of airway followed by slow inhalational induction with gradually increasing sevoflurane, while maintaining her spontaneous breathing, we secured her airway using fiber optic bronchoscopy. The surgery and the extubation went uneventful. In conclusion a planned airway management using fiber optic bronchoscope after airway topicalization and sevoflurane induction is the ideal technique in an expected case of difficult pediatric airway.

Key words: Difficult airway; fiberoptic intubation; maxillary tumor

Introduction

The anesthetic management of children with craniofacial abnormalities often presents with unique problems in terms of airway management. A large maxillary tumor often causes disruption of normal anatomy of surrounding structures. The relative difficult problem becomes even graver in the pediatric age group because of their uncooperativeness. Anesthetic management of such a difficult airway is a real challenge.

The present case is about the expected airway difficulty and its planned management in a pediatric patient.

Case Report

A 9-year-old girl weighing 25 kg, presented with a huge swelling on the left side of the face causing gross facial asymmetry. The swelling had increased to present size over 5 years as in Figure 1.

Examination revealed that the swelling is involving the left maxillary and mandibular area. Left half of the nose was also involved along with the deviation of upper lip. Preoperative assessment was carried out thoroughly with routine investigations, child was otherwise healthy with no comorbid condition. Mallampati classification was not possible due to extreme deviation [Figure 2], thyromental distance 6 cm, adequate but deviated mouth opening and upper lip bite test — Grade III.^[1] Nasal patency check was also done and found that right nostril had much better flow.

The child's parents were counseled regarding the nature of difficult airway and its management options like fiberoptic intubation and tracheostomy and informed consent was taken. The ENT surgeons were also asked to be prepared for emergency tracheostomy.

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Figure 1: 9-year-old girl with a large maxillary tumor



Figure 2: Upper airway examination

The girl was uncooperative from the very beginning. With much counseling and in the presence of her parents, she became ready for the intravenous cannulation in the right arm where EMLA cream had already applied on the dorsum of hand. In the preoperative area, two drops of xylometazoline was instilled in each nostril and she was nebulized with lignocaine 4% (2.5 ml) for 15 min. She was made to gargle with lignocaine viscous 2% for 2 min and her oropharynx and nasopharynx were sprayed using lignocaine 10%. Just before going to operation theatre she became very anxious, so under supervision and saturation monitoring, she was slowly administered a total dose of intravenous midazolam 1.25 mg in the holding area.

In the operation theatre electrocardiography, pulse oximeter, and blood pressure monitors applied and intravenous Ringer's lactate drip started. Intravenous glycopyrrolate 0.2 mg was given to reduce secretions and ondansetron 2.5 mg as postoperative nausea and vomiting prophylaxis. Although awake fiberoptic intubation would have been ideal, in a frightened child it was out of question. Initially she was preoxygenated using adult mask size 5 with 100% oxygen for 3 min to increase her oxygen reservoir and then inhalational induction was started with sevoflurane in 100% oxygen. Facial asymmetry in this child was such that achieving a tight seal using mask was very difficult even with the adult size, so after a gradual and gentle dilatation a lubricated nasopharyngeal airway (NPA) size 5 was put in right nostril and the breathing circuit was attached to it through endotracheal tube (ETT) connector and adequate spontaneous ventilation assured. Concentration of Sevoflurane gradually increased to 6% while preserving spontaneous breathing. Fiber optic bronchoscope (FOB) was then passed through the mouth to visualize vocal cords and advanced into trachea to locate carina. Child did not show any reflex response to the insertion of bronchoscope because of well anesthetized airway

with topical local anesthetics (LA). The cuffed ETT size 6 was advanced over bronchoscope in the trachea and its position above the carina was confirmed. The ETT was then connected to anesthetic breathing circuit and the correct placement of tube in the trachea was confirmed by end tidal carbon dioxide and bilateral chest auscultation. Adequate oropharyngeal packing done to avoid trickling of blood in trachea. Vecuronium 2.5 mg was used for muscle relaxation and intravenous fentanyl 50 mcg along with intravenous paracetamol 300 mg were given for analgesia. Anesthesia was maintained with isoflurane 1% in 40:60 oxygen and air. At the end of surgery, oropharyngeal suctioning was done, throat pack removed and residual neuromuscular blockade was reversed with neostigmine 1.5 mg and 0.2 mg glycopyrrolate. The child was allowed to regain complete consciousness and reflexes, and then was extubated. She was shifted to recovery room and her postoperative vitals were within normal limits.

Discussion

Awake fiberoptic intubation with topical anesthesia in anticipated difficult airway is regarded as the safest approach but patient's co-operation is essential, so it is not an ideal option for children.^[2] In our case also the child was uncooperative. Topical anesthesia of airway improves child's acceptance of an airway device and blocks airway reflexes. Nebulized lignocaine 4%, lignocaine viscous 2% and lignocaine spray 10% all are useful and can be used preoperatively or during induction. It can be used as a sole technique in adults but in children it is used in conjunction with either inhalational or intravenous induction.

Intravenous anesthetics can precipitate sudden loss of airway control and apnea, which may result in cannot intubate or ventilate situation.^[3] Inhalational induction in children using sevoflurane is preferred as spontaneous breathing can be

preserved by this method as it has a low blood gas solubility of 0.69 and is least irritating to the airway. It has an important role in the management of difficult pediatric and adult airway as depth of anesthesia can be rapidly altered and the patient can be awakened if optimum airway control is not achieved.^[4]

NPAs are generally well-tolerated by conscious children and used in the management of children with congenital maxillofacial abnormalities, syndromic craniosynostosis,^[5] mid-facial hypoplasia or to support the upper airway posttrauma or surgery.^[6] Our patient, accepted the NPA under the effect of midazolam and topical anesthesia, and was slowly put to sleep by gradually increasing inspired concentration of sevoflurane to 6% while spontaneous breathing was preserved. Since the child was also difficult to mask ventilate, following denitrogenation, NPA connected to the breathing circuit, while closely watching her respiration. Sreeramalu *et al.*^[7] also report airway management of a similar case in a 22-year-old boy where they used adult size mask for mask ventilation, but there the swelling involved both sides of the face so bilateral asymmetry was less in comparison to our case also the mask was held by two pairs of hands to minimize the leak after closing the nostrils with cotton balls instead of using NPA.

Another concern for the difficult pediatric airway is the limited volume of topical LA that can be used due to small patient size and the scarce data on safe topical lidocaine dosing. Our patient remained quite stable throughout the peri operative period. Comparing risks of inadequate airway topicalization with mild systemic LA toxicity, we favored the decision to combine all the available modalities of airway topicalization.

Conclusion

In an expected case of difficult airway, early intervention in the form of FOB is warranted rather than keeping it as a backup plan following multiple direct laryngoscopy attempts, as the latter can deteriorate the fiberoptic view and result in catastrophe. Limitations of fiberoptic intubation in children include the significant time necessary for skill acquisition,

the processing and preparation time of the equipment, the fragility of the bronchoscope, and the high purchase and repair costs. Despite these limitations, it remains the “gold standard” for accomplishing tracheal intubation in the difficult pediatric airway.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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