Case Report

Giant oral tumor in a child with malnutrition and sickle cell trait: Anesthetic challenges

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Abstract

Pediatric oral tumors have always been challenging for the even most skilled anesthesiologists. The conventional method of awake intubation is not realistic in this age group. The management is to chart out a plan to intubate the child post induction. We describe successful management of a case of giant of ossifying fibroma in a child with sickle cell trait where non-conventional innovate approach helped us to secure the airway pre-operatively and avoid possible medical complications.

Key words: Anesthesia, airway tumor, difficult airway, pediatric airway tumor

Introduction

A normal pediatric airway in itself is a challenge to the anesthesiologist. In scenarios with distorted anatomy and possibility of bleeding into the airway, even more cautious approach is warranted as it not only makes securing the airway difficult but also can lead to catastrophic aspiration of blood. The conventional method of awake fiber-optic intubation also faces practical limitations in pediatric patients.[1] We describe a pediatric case of giant ossifying fibroma where a innovative approach helped to secure the airway pre-operatively without the above possible complications.

Case Report

An 8-year-old male child presented with a huge oral mass developing since last 1½ year [Figure 1]. He had shifted to liquid diet as oral cavity could not accommodate nor chew solid food. Poor feeding obtunded his growth and he weighed only 9 kg. He could sleep only in lateral position as severe snoring due to mass was noted in supine position. Obstruction however was not evident even in supine position once he was awake.

Head and neck roentogram/Computed Tomography showed the tumor to be ossifying in nature [Figures 2 and 3] and a diagnosis of ossifying fibroma was to be confirmed after biopsy. He was referred to dental surgery where tumor excision biopsy was planned under general anesthesia.

Pre-operatively, he was evaluated for chronic malnourishment. Routine biochemical investigations showed hemoglobin of 6.4 mg/dl, total leucocyte count of 4800/ml, albumin of 2.2 gm/dl. Besides sodium and potassium, serum magnesium and calcium were evaluated for micronutrient deficiencies. Peripheral blood film showed hemolysis associated with sickling. Electrophoresis showed sickle cell hemoglobin to be less than 20% of total hemoglobin. Liver/renal function tests were unremarkable.

Nasal intubation was planned, as oral cavity was practically not accessible due to the mass [Figure 1]. Informed/written consent was obtained from father explaining possible need for post-operative ventilation. Pre-operatively anxiolytic was omitted to avoid possibility of obstruction due to sedation, however, anti-sialagogue (glycopyrollate-intravenous) was prescribed.

An intravenous line was secured by applying Eutectic Mixure of Local anesthetics in ward a day prior to surgery. One unit of packed RBCs (Red Blood Cells) was transfused and maintenance fluid drip (Ringer Lactate at 40 ml/h) was started during the fasting period.

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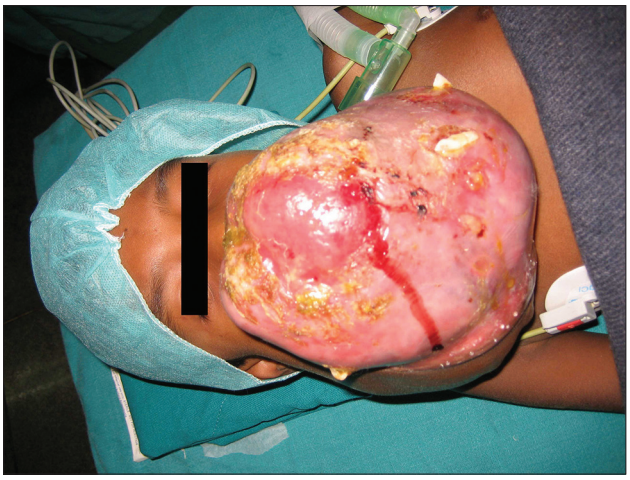

Figure 1: Gross appearance of tumor – No mask ventilation or conventional intubation possible

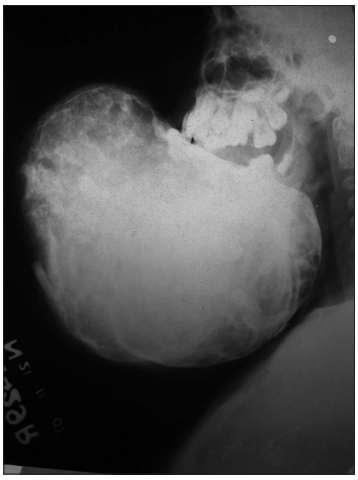

Figure 2: Lateral X-ray of the child showing extent and ossifying nature of tumor

Inhalation induction using sevoflurane in oxygen was planned to avoid likelihood of apnea associated with intravenous agents. After connecting routine monitoring, during pre-oxygenation no conventional available facemasks could fit patient's facial contours. Thus, inhalation induction using nasopharyngeal airway was planned. He was shifted to recovery where in parental presence nebulization with 4% lignocaine using simple facemask was carried out. On shifting back to operating room, 0.25 mg intravenous midazolam was given and xylometazoline drops were put in the right nares. A lubricated nasopharyngeal airway was inserted in to right nares and an endotracheal connector was inserted to its end where anesthesia circuit was attached. Sevoflurane in oxygen was used via the same circuit to induce anesthesia. Since the airway had bypassed the oropharynx [obstructive site due to tumor] the child did not obstruct and could be assisted while spontaneous breathing. He was simultaneously intubated with 5 mm PVC (Polyvinyl Chloride) uncuffed ETT (Endotracheal Tube) using the pediatric flexible fiber-optic bronchoscope via left nares.

No ventilatory difficulties were encountered during the surgery. The surgical team ruled out compression/involvement of tracheal wall by mass [Figure 3], negating possibility of tracheomalacia that could become significant on extubation. During 2 h surgery he lost 50-70 ml of blood and received around 200 ml ringer lactate as maintenance fluid. He was electively ventilated overnight in intensive care unit and was extubated the next morning. No post-operative complications or airway obstruction was noted and he was shifted to the ward next evening.

Discussion

Ossifying fibroma is a slow growing tumor involving skull bones.[2] It remains localized; thus, excision is possible with good prognosis.[3] These tumors are often excised at much smaller size unlike our patient who neglected medical care for long. The child was unable to feed due to hardly any oral opening left relative to mass. Prolonged decrease in food intake lowers body hemoglobin,[4] which was contributory to sickle cell trait found incidentally in our patient. Perioperative concerns with sickling include pulmonary, bone, and cerebral crisis.[5] These can be avoided if sickle cell hemoglobin is lower than 30% of total hemoglobin.[6] In our patient, this was less than 20% and would have decreased upon transfusion of normal PRBC (Packed Red Blood Cells); thus, no further specific measures were needed. We were liberal with maintenance fluids and vigilant throughout the procedure avoiding any desaturation, which could precipitate sickling associated problems.[7]

Another unique aspect of chronic malnutrition in our patient was associated low albumin. Albumin is a strong predictor of post-operative pulmonary complications.[8] Patients should be built up prior to elective surgery, this not possible in our case due to mass obstructing feeding. Any delay would have led to further increase in mass size. Electrolyte deficiencies such as hypomagnesemia[9] and hypocalcemia can be associated with malnutrition and can cause arrhythmias and post-operative muscle weakness. Thus, these must be evaluated and corrected pre-operatively.

He had history of snoring without features of obstructive sleep apnea, which is a predictor of difficult mask ventilation.[10] In addition the huge size of tumor relative to face made it impractical to rely upon mask ventilation as a rescue of failed intubation.[11] We would have been unable to assist spontaneous breathing and providing a CPAP (continuous positive airway pressure), which is often vital in an obstructing airway.[12] In absence any oral space, laryngeal mask airway was also not possible. Thus, we resorted to use of a conduit

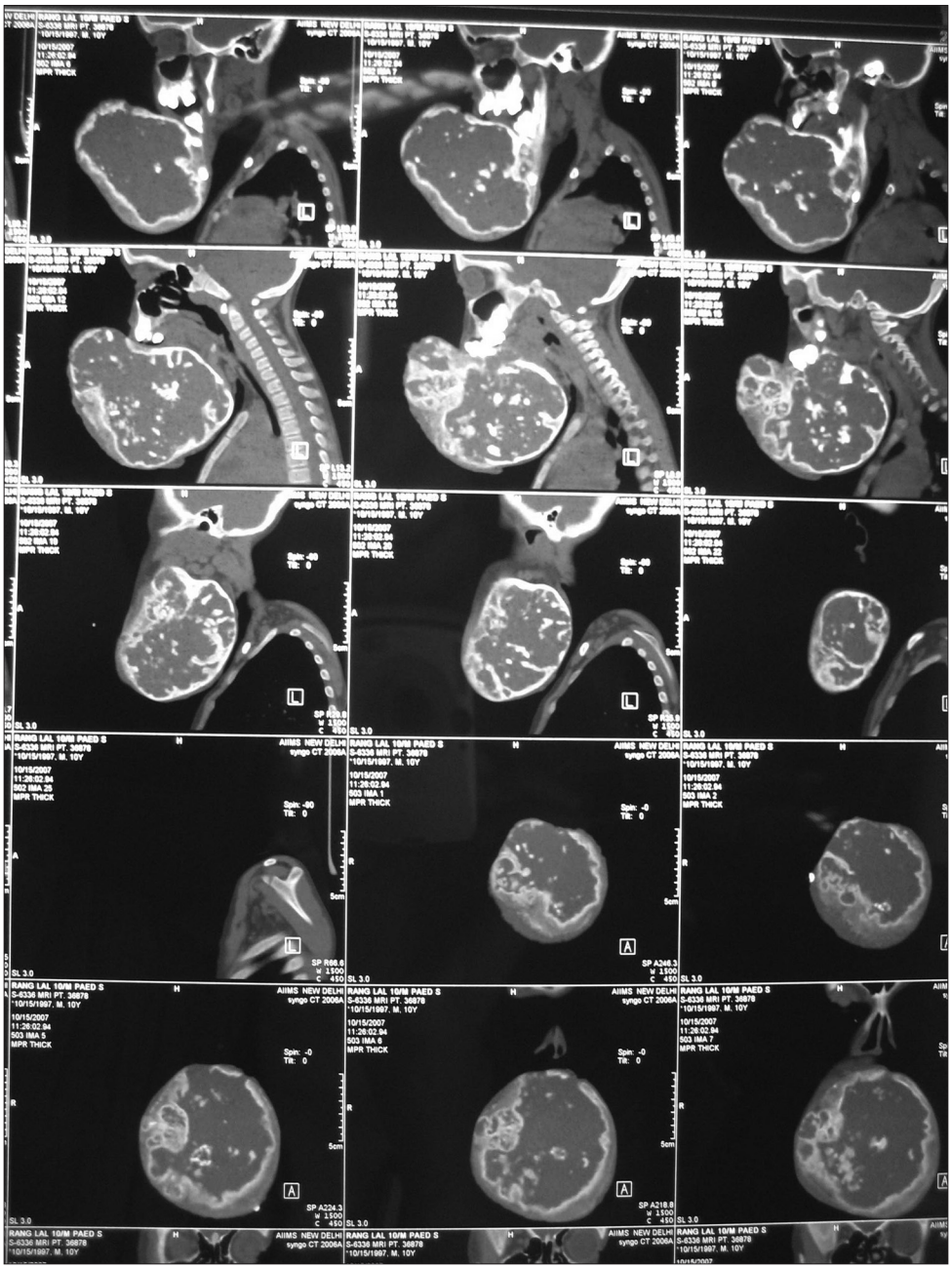

Figure 3: Computed tomography scan showing extent of airway involvement and degree of sparing (important for planing to secure airway)

in form of nasopharyngeal airway bypassing the obstructive segment of airway[Figure 3].

Nasopharyngeal airway is well-tolerated in sedated individuals[13] and if the nasal cavity is well anesthetized it becomes more acceptable. We used lignocaine nebulization to anesthetize the nasal mucosa allowing use of airway in sedated child. Additionally anesthetizing the upper airway prevented airway responses during flexible fiber-optic bronchoscope guided intubation. An ETT connector can be attached to nasopharyngeal airway to which an anesthesia circuit with EtCO2 monitor can be attached. The airway can be fixed in ideal position by observing transmitted breathing movements in bag and an optimal EtCO2 curve. Once the nasopharyngeal airway is in place, on occluding the other nostril we were able to provide CPAP splinting the collapsing airway. Thus if the child became apneic we could still be able to ventilate using Intermittent positive pressure ventilation. The same conduit was used to induce anesthesia-using the sevoflurane and when adequate depth of anesthesia was obtained other nostril was used to intubate using the flexible fiber-optic bronchoscope.

Use of newer devices like video laryngoscopes was also contraindicated due to limited mouth opening.[14] The tumor tissue was friable and any trauma would have led to bleeding, this would have obscured the possibility of using any optics-based device. Furthermore, in such a situation flexible

fiber-optic bronchoscopy would have failed.[15] We avoiding manipulating the mass to avoid any traumatic bleeding. Pre-operative tracheostomy under local anesthesia also was not possible due to practically any access to the neck, which was entirely covered by the bony mass.

The trachea was not extubated and child was electively ventilated overnight due to possibility of edema associated with airway surgery. Thus a nasopharyngeal airway can be used effectively to tide over the crisis in pediatric difficult airway situations until a permanent solution is achieved to secure the airway.

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